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ABSTRACT

This is one of a series of reports which provide definitions of and descriptive data on the variables used in the Comparative Study of Phase IV of the Individually Guided Education (IEG) Evaluation Project. Phase IV investigated three curriculum programs specifically designed to be compatible with instructional programming for the individual student: (1) the Wisconsin Design for Reading Skills Development (WDRSD); (2) Developing Mathematical Processes (DMP); and (3) Prereading Skills (PRS). Information on instructional methods and pupil outcomes for grades 2 and 5 was collected from achievement monitoring and domain referenced tests, teacher logs, and classroom observations. This paper focuses on a single variable: mathematics achievement. It reports data by schools and by school type and curriculum group for the eight achievement monitoring test administrations and the three domain-referenced test administrations. The achievement monitoring test results are reported by the general objectives tested (seven for grade 2, nine for grade 5). The domain referenced test results are reported by the three basic objectives and include domain and item difficulty. Appendixes, the bulk of the document, include the test forms administered during the Comparative Study, Phase IV. (BS)

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Phase IV

Project Paper 80-9

MATHEMATICS ACHIEVEMENT COMPARATIVE STUDY PHASE IV IGE EVALUATION PROJECT

by Norman L. Webb and Anne G. Nerenz

August, 1980

Wisconsin Research
and Development Center
for Individualized Schooling

TM 840 811

Phase IV

Project Paper 80-9

MATHEMATICS ACHIEVEMENT COMPARATIVE STUDY PHASE IV IGE EVALUATION PROJECT

by

Norman L. Webb
Anne G. Nerenz

Report from the
IGE Evaluation Project

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Abstract

This report is one in a series of papers which provide definitions of and descriptive data on the variables used in the Comparative Study of Phase IV of the IGE Evaluation Project. Specifically, it deals with a single variable--Mathematics Achievement--and reports data by schools and by school type and curriculum group for the eight administrations of the achievement monitoring tests and three administrations of the domain referenced tests. A more detailed description of the design of the study and the expected relationships among the variables is provided in Project Paper 80-2 (Romberg, Webb, Stewart & Nerenz, 1980) and the reader may find that report helpful in understanding the data reported here.

I

Introduction

The IGE Evaluation Project has as a central objective the identification of features of IGE schooling which contribute to successful instruction, especially in reading skills and mathematics. Although the first four phases of this project focused on different aspects of IGE, they were designed to provide complementary data bases resulting in a comprehensive description of this form of schooling. With this goal in mind, Phase IV was designed to supplement information collected in Phases I and III by providing detailed information on a small number of curricular and instructional variables. That is, whereas these phases investigated organizational, system, general means of instruction, and general achievement variables, the main purpose of Phase IV was to investigate the three R & D Center-produced curriculum programs whose instructional procedures and materials were specifically designed to be compatible with instructional programming for the individual student. These programs are the Wisconsin Design for Reading Skills Development (WDRSD) (Otto, 1977), Developing Mathematical Processes (DMP) (Romberg, 1977), and Prereading Skills (PRS) (Venezky & Pittelman, 1977).

Phase IV was divided into two parts--the Descriptive Study and the Comparative Study--and information on the design and procedures used during each portion may be found in Project Papers 79-42 and 80-2 (Webb & Romberg, 1979; Romberg, Webb, Stewart & Nerenz, 1980). Briefly, each part was designed to provide detailed information on two variables--

means of instruction and pupil outcomes--using achievement monitoring and domain referenced tests, teacher logs, and classroom observations. In addition, a smaller amount of information on background, organizational, and program variables was obtained using principal, unit leader, and teacher interviews. This paper focuses on the data obtained from the mathematics achievement monitoring and domain referenced tests. Reported are the aggregated general objective scores for students in Grade 2 classes from 8 schools and Grade 5 classes from 6 schools over the eight test administrations and the scores from the three administrations of the domain referenced tests. Included in the appendices are the test forms that were administered.

II

Data Collection and Analysis

Development and Administration

Achievement Monitoring Tests. A total of fourteen basic objectives were tested at each grade level using the achievement monitoring tests. After the objectives were aggregated into general objectives, a total of seven general objectives were tested at Grade 2 and a total of nine general objectives were tested at Grade 5. Tables 1 and 2 show the item number, basic objective, and general objective for each of the objectives tested at Grades 2 and 5, respectively.

The achievement monitoring tests used in the Comparative Study were essentially the same as those used in the Descriptive Study. Considering the results of the testings in the Descriptive Study, a few items were eliminated and some new items were added. Another difference between the tests used in the two studies was the students were required to give the answers in the Descriptive Study whereas in the Comparative Study all of the items were multiple choice. The test development procedures, analyses, and reliability estimates for the Descriptive Study tests are reported in Project Papers 79-28, 79-1, 79-4, and 79-7 (Webb, 1979 a-d). The achievement monitoring tests used for the Comparative Study are included as Appendices A (Grade 2) and B (Grade 5).

Briefly, the procedures used in creating the tests were to identify the most important basic objectives to be tested at each grade

TABLE 1

Mathematics Content Aggregations and
Achievement Monitoring Test Item Numbers
Grade 2

General Objective		Specific Objective		Objective	Item Numbers
Case Number	Descriptor	Case Number	Descriptor	Case Number	
01	Writing numbers	01	Compact notation	11*	1,2
		02	Compact notation 100-999	12	3
		03	Grouping or expanded notation	13	4
02	Inequalities	04	Order numbers	14	5
		05	Other (symbols, order sentences)	15	
03	Other place value or numeration	06	Other place value or numeration (i.e. reads)	21	
04	Addition/Subtraction	07	Computes sum 0-99	22	10
		08	Computes difference 0-99	23	11
		09	Solves open sentence 0-20	24*	7,8
		10	Solves open sentence 0-99	25	9
05	Multiplication	11	Computes product 0-100	31	
06	Fractions	12	Represents fractional names	32	12
		13	Identifies fractional part	33	13
		14	Other	34	
07	Measurement	15	Length	35	14
		16	Capacity	41	
08	Word Problems	17	Writes sentence 0-99	42*	6
		18	Solves word problems	43	15,16
09	Applications	19	Solves application problems	44	17,18
10	Geometry	20	Geometry	45	
11	Miscellaneous	21	Time, money, tables, graphs, properties, attributes	51	

*Objectives tested by Domain Referenced procedure.

TABLE 2

Mathematics Content Aggregations and
Achievement Monitoring Test Item Numbers
Grade 5

General Objective		Specific Objective		Objective	Item Numbers
Case Number	Descriptor	Case Number	Descriptor	Case Number	
01	Addition/Subtraction	01	Computes sum 0-99,999	34	11
		02	Computes difference of 3 to 5 digit numbers	35	
02	Multiplication	03	Finds product 0-9,999	32*	12,13
		04	Finds product 0-999,999	33	14
03	Division	05	Divides by 1-digit using algorithm	25*	15,16
		06	Divides 3-digit numbers by 2-digits	31	
04	Concept	07	Concept	11	
		08	Equivalent fractions	12*	1,2
		09	Orders fractions	13	8
05	Computes	10	Solves fraction sentences (+ or -)	14	6
		11	Solves a x b = □ involving fractions	15	7
06	Concept	12	States equivalent decimal for common fraction	21	3
07	Computes	13	Finds product of whole number and decimal	22	17
		14	Computes decimal sum	23	5
		15	Computes decimal difference	24	4
08	Measurement	16	Measurement	43	
09	Word Problems	17	Writes x or ÷ sentence	44	
		18	Solves word problems	45	9,10
10	Applications	19	Solves application problems	51	18,19
11	Geometry	20	Geometry	42	
12	Miscellaneous	21	Other Computations	41	
		22	Numeration system, place value, number theory graphs, tables	52	

*Objective tested by Domain Referenced procedure.

level. For each basic objective four or eight items were written that paralleled items used in the topic inventories of the DMP materials when appropriate. These items were divided evenly among four test forms so that each item number on each form corresponded to the same basic objective. The students at each school who participated in the study were divided into four groups. For each test time, each group received a different form. The forms were rotated among the four groups over the eight test times so that each group of students took each form once during the first four test times and once during the last four test times.

Domain Referenced Tests. Three basic objectives for each grade level were identified to be tested using the domain referenced tests. The criteria used to select the three objectives were their importance to the mathematics curriculum and the ease by which the domain for the objective could be defined. The objectives tested using the domain referenced tests are indicated by a * in Tables 1 and 2. A detailed description of the testing procedure and analyses is given in Project Papers 79-28, 79-9, 79-11, and 79-13 (Webb, 1979a, e-g). The tests administered in the Comparative Study are included as Appendices C (Grade 2) and D (Grade 5).

Briefly, for each basic objective selected the domain of the objective was specified ensuring that the dimensions of the objective that were tested in the topic inventories of the DMP material were

included. Then for each of three test times, ten items were randomly selected, with certain constraints, from the domain of items for each objective. The constraint from the random selection was that the various dimensions of the objective were representated by the same proportion of items as those types of items appearing in the topic inventories. The three times that tests were administered were Test Time 1 (October), Test Time 4 (January), and Test Time 8 (May). Because of certain complications such as a severe snowstorm in January, data are not available for three schools at Grade 5 for Test Time 2. The scores for Grade 5 for test time 2 are not reported.

All of the students tested were administered the same domain referenced test. The items were all completion items to eliminate the possibility of guessing. The items were scored as either right or wrong.

Analysis

Achievement Monitoring Tests. For each general objective, an objective easiness was computed by taking the ratio of the number of correct responses to the total possible responses over all of the test items included for the general objective. For example, for the Grade 2 general objective of writing numbers (01), 16 items were administered--four items on each of the test forms. The numbers of correct responses on each item were summed and then divided by the total number of possible responses, four times the number of students tested. The objective easiness provides a measure for the group of students of the achievement for the general objective.

Domain Referenced Tests. In addition to the standard test statistics for each of the objectives tests, a procedure developed by Harris and Pearlman (1978) was used to analyze the domain referenced tests. The Harris and Pearlman analysis provides an index of the domain difficulty as well as an index of item difficulty for each item. The advantage of this procedure is that the percent correct for the item is calculated as a product of the domain difficulty ($\hat{K}$) and item difficulty. These two indices provide indication of the ability of the students to understand the general concepts that are associated with the objective as well as the specific knowledge that is needed to respond to the individual items.

III

DISCUSSION

Achievement Monitoring Tests, Grade 2

The objective easiness for all of general objectives by test time and school are given in Table 3. The mean objective easiness is given for each of the three groups of schools. The gain score from Test Time 1 to Test Time 8 is given in the right column. The objective easiness score has a value of 0 to 1.00 with the higher values representing that the objective was easier for the group of students. The discussion for each objective will include a discussion of the results for Test Time 1, the overall trend in achievement over the eight test times, and the gain over the total period of investigation.

Writes Numbers (01). The three groups of schools are very sililar on this objective for Test Time 1. Over the eight test times the achievement scores generally were increasing except for some isolated cases, for example, for School 421 between Test Time 7 and 8. The two IGE/DMP had the highest gain scores with the gain scores for the other two groups of school being very similar. Overall all the groups of students scored relatively high on this objective for Test Time 8.

Inequalities (02). The Test Time 1 mean scores for the three groups of schools are similar except there is some variation within each group. Thus initial variation on achievement for inequalities is more

Table 3

Math Achievement by Test Time for Eleven General Objectives

Grade 2

School Type and Number	Test Time 1 October	2	3	4	5	6	7	8 May	Gain T8 - T1
				01 Writing Numbers					
IGE/DMP									
440	.49	.64	.58	.69	.71	.72	.75	.78	.29
593	.58	.71	.81	.83	.82	.86	.88	.87	.29
MEAN	.54	.68	.70	.76	.76	.79	.82	.82	.29
IGE/Non-DMP									
428	.48	.56	.60	.61	.58	.64	.73	.71	.23
421	.49	.58	.66	.62	.70	.73	.85	.71	.22
333	.62	.71	.73	.78	.78	.82	.80	.77	.15
MEAN	.53	.62	.66	.67	.69	.73	.79	.73	.20
Non-IGE/DMP									
904	.51	.57	.64	.67	.64	.72	.74	.73	.22
906	.62	.61	.66	.71	.84	.80	.81	.84	.22
762	.45	.50	.55	.59	.64	.58	.68	.60	.15
MEAN	.53	.56	.62	.66	.71	.70	.74	.72	.20

Table 3 (continued)

Grade 2

School Type and Number	Test Time 1 October	2	3	4	5	6	7	8 May	Gain
02 Inequalities									
IGE/DMP									
440	.24	.45	.44	.44	.57	.52	.62	.57	.33
593	.40	.48	.50	.68	.70	.74	.82	.84	.44
MEAN	.32	.46	.47	.56	.64	.63	.72	.70	.38
IGE/Non-DMP									
428	.31	.60	.41	.56	.61	.58	.64	.60	.29
421	.43	.55	.50	.53	.63	.79	.87	.78	.35
333	.36	.58	.71	.72	.73	.78	.77	.79	.43
MEAN	.37	.58	.54	.60	.66	.72	.76	.72	.36
Non-IGE/DMP									
904	.41	.36	.33	.39	.50	.63	.46	.72	.31
906	.27	.42	.56	.65	.68	.70	.71	.73	.46
762	.41	.12	.14	.19	.41	.35	.37	.44	.03
MEAN	.36	.30	.34	.41	.53	.56	.51	.63	.27

Table 3 (continued)

Grade 2

School Type and Number	Test Time 1 October	2	3	4	5	6	7	8 May	Gain
04 Addition/Subtraction									
IGE/DMP									
440	.32	.34	.43	.36	.39	.40	.44	.44	.12
593	.40	.48	.46	.55	.66	.68	.71	.78	.38
MEAN	.36	.41	.44	.46	.52	.54	.58	.61	.25
IGE/Non-DMP									
428	.32	.40	.33	.40	.43	.44	.48	.46	.14
421	.35	.36	.38	.41	.50	.52	.63	.53	.18
333	.43	.44	.51	.62	.59	.61	.63	.61	.18
MEAN	.37	.40	.41	.48	.51	.52	.58	.53	.17
Non-IGE/DMP									
904	.31	.41	.41	.36	.47	.42	.57	.54	.23
906	.37	.44	.38	.56	.43	.51	.62	.63	.26
762	.24	.25	.35	.35	.34	.40	.39	.44	.20
MEAN	.31	.37	.38	.42	.41	.41	.44	.54	.23

Table 3 (continued)

Grade 2

School Type and Number	Test Time 1 October	2	3	4	5	6	7	8 May	Gain
06 Fractions									
IGE/DMP									
440	.34	.44	.44	.38	.62	.53	.64	.54	.20
593	.51	.61	.72	.51	.53	.50	.54	.56	.05
MEAN	.42	.52	.58	.44	.58	.52	.59	.55	.12
IGE/Non-DMP									
428	.41	.30	.28	.35	.39	.45	.47	.41	0
421	.59	.66	.49	.41	.65	.63	.68	.67	08
333	.52	.35	.42	.43	.56	.60	.53	.53	.01
MEAN	.51	.44	.40	.40	.53	.56	.56	.54	.03
Non-IGE/DMP									
904	.30	.42	.50	.46	.63	.68	.67	.60	.30
906	.38	.35	.44	.50	.59	.65	.69	.59	.21
762	.38	.31	.45	.40	.41	.50	.45	.43	.05
MEAN	.35	.36	.46	.45	.54	.61	.60	.54	.19

Table 3 (continued)

Grade 2

School Type and Number	Test Time 1 October	2	3	4	5	6	7	8 May	Gain
	07 Measurement								
IGE/DMP									
440	.56	.55	.50	.69	.49	.54	.70	.57	.01
593	.56	.62	.80	.77	.74	.83	.82	.75	.19
MEAN	.56	.58	.65	.73	.62	.68	.76	.66	.10
IGE/Non-DMP									
428	.88	.97	.91	.94	.94	1.00	.91	.97	.09
421	.25	.86	.57	.60	.70	.78	.76	.88	.63
333	.70	.67	.69	.66	.94	.93	.87	.83	.13
MEAN	.61	.83	.72	.73	.86	.90	.85	.89	.28
Non-IGE/DMP									
904	.11	.36	.46	.48	.27	.48	.42	.80	.69
906	.38	.29	.48	.39	.50	.43	.54	.32	-.06
762	.28	.29	.50	.50	.38	.32	.67	.53	.25
MEAN	.26	.31	.48	.46	.38	.41	.54	.55	.29

Table 3 (continued)

Grade 2

School Type and Number	Test Time 1 October	2	3	4	5	6	7	8 May	Gain
				08 Word Problems					
IGE/DMP									
440	.26	.35	.39	.36	.43	.42	.42	.48	.22
593	.46	.56	.41	.53	.65	.63	.72	.71	.25
MEAN	.36	.46	.40	.44	.54	.52	.57	.60	.24
IGE/Non-DMP									
428	.31	.28	.32	.40	.40	.50	.41	.43	.12
421	.33	.40	.33	.32	.49	.45	.55	.48	.15
333	.34	.35	.56	.45	.52	.47	.51	.49	.15
MEAN	.33	.34	.40	.39	.47	.47	.49	.47	.14
Non-IGE/DMP									
904	.28	.31	.47	.38	.38	.37	.40	.33	.05
906	.32	.32	.39	.49	.42	.51	.53	.47	.15
762	.33	.22	.34	.23	.24	.25	.20	.28	-.05
MEAN	.31	.28	.40	.37	.35	.38	.38	.36	.05

Table 3 (continued)

Grade 2

School Type and Number	Test Time 1 October	2	3	4	5	6	7	8 May	Gain
09 Applications									
IGE/DMP									
440	.36	.23	.28	.32	.42	.38	.44	.46	.10
593	.28	.40	.33	.41	.45	.42	.57	.62	.34
MEAN	.32	.32	.30	.36	.44	.40	.50	.54	.22
IGE/Non-DMP									
428	.28	.18	.26	.28	.32	.38	.32	.40	.12
421	.46	.39	.36	.30	.39	.58	.60	.65	.19
333	.43	.31	.38	.44	.34	.53	.56	.44	.01
MEAN	.39	.29	.37	.34	.35	.50	.49	.50	.11
Non-IGE/DMP									
904	.44	.38	.27	.41	.29	.30	.36	.54	.10
906	.36	.40	.56	.50	.43	.41	.40	.30	-.06
762	.22	.24	.16	.19	.26	.19	.33	.24	.02
MEAN	.34	.34	.33	.37	.33	.30	.36	.36	.02

by school than by school/program type. In general, achievement increased steadily for the eight test times at four of the schools--440, 593, 421, and 906. At Schools 904 and 428, achievement fluctuated over the eight test times. At School 333, a large increase was made between test times 1 and 3 and then the level of achievement was maintained over the remaining test times. Achievement was down for test times 2 and 4 for School 762 but recovered to the initial level at test time 5 and stayed approximately the same for very little gain. The IGE/DMP and IGE/non-DMP groups had the largest mean gains. The non-IGE/DMP group was lower mainly because of one school, School 762. Achievement was relatively high at five of the schools at test time 8, moderate at two schools (440 and 428), and low at School 762.

Addition/Subtraction (04). The mean scores for the three groups of schools are similar at test time 1. Only School 762 had a score below 30. Six of the schools (593, 333, 904, 906, and 762) over the eight test times, had sharp increases in achievement between one or more pairs of test times. The remaining two schools (440 and 428) had smaller increases in achievement over the period of investigation. The mean gain scores were higher for the DMP schools. However, there was a sizeable difference in gain scores between the two IGE/DMP schools. The variation among schools in scores at test time 9 is large, greater than on other objectives.

Fractions (06). Generally IGE/non-DMP schools were higher on achievement at Test Time 1 than the other schools. There appears to be more fluctuation on achievement over the eight test times on this objective than on other objectives. Only Schools 440, 904, and 906 had a generally steady increase in achievement. The gain scores are low except for these three schools. This may be indicative of the other schools not allocating time to fractions.

Measurement (07). There were large within-group variations on this objective at Test Time 1 with IGE/DMP and IGE/non-DMP generally scoring higher than non-IGE/DMP schools. Only four items were used to measurement achievement on this objective so that the scores are less stable than for the other objectives. This accounts for part of the large fluctuation over test times for some of the schools. All of the schools had decreases in achievement at least between one pair of test times. The test time 8 scores for the IGE/non-DMP schools were all very high. The gain scores varied greatly with two schools having gains of over 60 and one school having a decline in achievement. Thus, there were large differences favoring the IGE/non-DMP schools in achievement on measuring lengths.

Word Problems (08). The mean scores for the three groups are similar for Test Time 1. The within-group variances are very small except for the two IGE/DMP schools. Both of these schools generally had a steady increase in achievement over the eight test times. Most of the other schools reached a high in achievement on one of the inter-

mediate test times and then declined in achievement by Test Time 8. The gain scores varied by group with low within-group differences except for non-IGE/DMP schools. The IGE/DMP schools increased the most over the investigation period. Only two schools, both non-IGE/DMP, had low scores, Schools 904 and 762.

Applications (09). The three groups of schools have similar means on the general objective applications for Test Time 1. However, there is variation within each group. The achievement for each of the IGE/DMP schools generally increased over the eight test times. The achievement pattern for four other schools--428, 333, 904, and 762--is best characterized as fluctuating over the period of investigation. The achievement curve for School 421 is concave with the minimum level of achievement occurring at Test Time 4. In contrast the achievement curve for School 906 is convex with a maximum point at Test Time 3. Overall, all but one school, 906, had some gain in achievement. Largest gains were made by IGE/DMP schools. The achievement scores for Test Time 8 of the IGE/non-DMP schools were very comparable to the IGE/DMP schools. Their gains scores were not as high because the IGE/non-DMP schools were generally higher in achievement at Test Time 1. Schools with lower overall gain scores tended to be those with fluctuating achievement curves.

Achievement Monitoring Tests, Grade 5

The objective easiness for all of general objectives by test time and school are given in Table 4. The mean objective easiness is given for each of the three groups of schools. The gain score from Test Time 1 to Test Time 8 is given in the right column. The objective easiness score has a value of 0 to 1.00 with the higher values representing that the objective was easier for the group of students. The discussion for each objective will include a discussion of the results for Test Time 1, the overall trend in achievement over the eight test times, and the gain over the total period of investigation.

Addition/Subtraction (01). All schools had a high level of achievement on adding and subtracting at Test Time 1. The objective easiness scores ranged from .78 to 100. Generally this high level of achievement was maintained for the eight test times with only a slight increase or decrease. School 440 had the largest decrease over the total period. Other schools decreased in achievement on one of the intermediary test times but regained the initial level of achievement by Test Time 8.

Multiplication (02). The initial achievement scores for the IGE/DMP and IGE/non-DMP schools were similar. One non-IGE/DMP school, 905, scored significantly lower than the other schools which lowered the mean for this group. The pattern of achievement for three of the schools--

Table 4

Math Achievement by Test Time for Twelve General Objective

Grade 5

School Type and Number	Test Time 1 October	2	3	4	5	6	7	8 May	Gain
01 Addition/Subtraction									
IGE/DMP									
440	.83	.88	.86	.80	.88	.73	.78	.74	-.09
593	1.00	.91	.89	.91	.87	.94	.91	.96	-.04
MEAN	.92	.90	.88	.86	.88	.84	.84	.85	-.06
IGE/Non-DMP									
428	.78	.80	.81	.89	.78	.85	.63	.81	.03
333	.92	.82	.79	.82	.84	.83	.81	.88	-.04
MEAN	6.85	.81	.80	.86	.81	.84	.72	.84	-.01
Non-IGE/DMP.									
905	.89	.78	.83	.81	.96	.90	.68	.85	-.04
906	.86	.84	.91	.87	.88	.91	.82	.82	-.04
MEAN	.88	.81	.87	.84	.92	.90	.75	.84	-.04

Table 4 (continued)

Grade 5

School Type and Number	Test Time 1 October	2	3	4	5	6	7	8 May	Gain
02 Multiplication									
IGE/DMP									
440	.62	.63	.78	.71	.61	.62	.60	.63	.01
593	.71	.81	.87	.93	.91	.91	.87	.86	.15
MEAN	.66	.72	.82	.82	.76	.76	.74	.74	.08
IGE/Non-DMP									
428	.58	.53	.54	.62	.60	.64	.56	.76	.18
333	.79	.80	.72	.75	.78	.74	.74	.73	-.06
MEAN	.68	.66	.63	.68	.69	.69	.65	.74	.06
Non-IGE/DMP									
905	.39	.54	.80	.72	.66	.77	.60	.76	.37
906	.65	.67	.82	.76	.77	.78	.76	.74	.09
MEAN	.52	.60	.81	.74	.72	.78	.68	.75	.23

Table 4 (continued)

Grade 5

School Type and Number	Test Time 1 October	2	3	4	5	6	7	8 May	Gain
03 Division									
IGE/DMP									
440	.31	.50	.49	.64	.47	.46	.51	.48	.17
593	.37	.70	.78	.85	.83	.91	.90	.82	.45
MEAN	.34	.60	.64	.74	.65	.68	.70	.65	.31
IGE/Non-DMP									
428	.36	.52	.60	.44	.43	.46	.48	.54	.18
333	.60	.59	.68	.70	.64	.64	.70	.64	.04
MEAN	.48	.56	.64	.57	.54	.55	.59	.59	.11
Non-IGE/DMP									
905	.11	.16	.21	.25	.59	.43	.26	.52	.41
906	.36	.33	.55	.69	.62	.64	.53	.60	.24
MEAN	.24	.24	.38	.47	.60	.54	.40	.56	.32

Table 4 (continued)

Grade 5

School Type and Number	Test Time 1 October	2	3	4	5	6	7	8 May	Gain
04 Fractions--Concept									
IGE/DMP									
440	.50	.41	.33	.50	.61	.74	.74	.76	.26
593	.40	.38	.40	.35	.40	.40	.45	.58	.18
MEAN	.45	.40	.36	.42	.50	.57	.60	.67	.22
IGE/Non-DMP									
428	.31	.32	.27	.44	.46	.50	.41	.55	.24
333	.40	.36	.46	.44	.53	.53	.56	.60	.20
MEAN	.36	.34	.36	.44	.50	.52	.48	.58	.22
Non-IGE/DMP									
905	.28	.30	.31	.29	.31	.53	.41	.48	.20
906	.70	.70	.75	.62	.70	.80	.80	.85	.15
MEAN	.49	.50	.53	.46	.50	.66	.60	.66	.18

Table 4 (continued)

Grade 5

School Type and Number	Test Time 1 October	2	3	4	5	6	7	8 May	Gain
05 Fractions--Computation									
IGE/DMP									
440	.18	.23	.10	.23	.38	.42	.42	.40	.22
593	.22	.15	.16	.16	.16	.20	.17	.29	.07
MEAN	.20	.19	.13	.20	.27	.31	.30	.34	.14
IGE/Non-DMP									
428	.11	.08	.17	.15	.11	.12	.18	.33	.22
333	.19	.16	.20	.23	.19	.28	.26	.23	.04
MEAN	.15	.12	.18	.19	.15	.20	.22	.28	.13
Non-IGE/DMP									
905	.11	.14	.14	.10	.10	.14	.29	.26	.15
906	.32	.34	.33	.24	.29	.53	.46	.51	.19
MEAN	.22	.24	.24	.17	.20	.34	.38	.38	.17

Table 4 (continued)

Grade 5

School Type and Number	Test Time 1 October	2	3	4	5	6	7	8 May	Gain
06 Decimal Fractions--Concept									
IGE/DMP									
440	.23	.28	.25	.24	.26	.27	.25	.42	.19
593	.36	.30	.25	.36	.51	.53	.26	.43	.07
MEAN	.30	.29	.25	.30	.38	.40	.26	.42	.13
IGE/Non-DMP									
428	.25	.28	.23	.30	.25	.27	.44	.23	-.02
333	.33	.29	.32	.25	.30	.28	.28	.39	.06
MEAN	.29	.28	.28	.28	.28	.28	.36	.31	.02
Non-IGE/DMP									
905	.11	.14	.17	.23	.14	.21	.35	.26	.15
906	.28	.18	.30	.13	.33	.29	.29	.36	.08
MEAN	.20	.16	.24	.18	.24	.25	.32	.31	.12

Table 4 (continued)

Grade 5

School Type and Number	Test Time 1 October	2	3	4	5	6	7	8 May	Gain
07 Decimal Fractions--Computation									
IGE/DMP									
440	.28	.36	.28	.34	.34	.40	.42	.43	.15
593	.54	.56	.63	.67	.82	.84	.89	.84	.30
MEAN	.41	.46	.46	.50	.58	.62	.66	.64	.22
IGE/Non-DMP									
428	.44	.44	.38	.48	.49	.46	.52	.59	.15
333	.47	.53	.50	.44	.44	.48	.46	.47	0
MEAN	.46	.48	.44	.46	.46	.47	.49	.53	.08
Non-IGE/DMP									
905	.31	.40	.39	.37	.41	.39	.36	.42	.11
906	.23	.30	.31	.38	.40	.38	.48	.54	.31
MEAN	.27	.35	.35	.38	.40	.38	.42	.48	.21

Table 4 (continued)

Grade 5

School Type and Number	Test Time 1 October	2	3	4	5	6	7	8 May	Gain
09 Word Problems									
IGE/DMP									
440	.39	.38	.44	.41	.46	.49	.50	.51	.12
593	.50	.37	.41	.42	.44	.45	.51	.55	.05
MEAN	.44	.38	.42	.42	.45	.47	.50	.53	.08
IGE/Non-DMP									
428	.28	.26	.27	.31	.30	.38	.39	.38	.10
333	.48	.38	.51	.52	.47	.46	.56	.54	.06
MEAN	.38	.32	.39	.42	.38	.42	.48	.46	.08
Non-IGE/DMP									
905	.43	.36	.38	.29	.31	.40	.32	.42	-.01
906	.58	.57	.66	.60	.62	.58	.64	.63	.05
MEAN	.50	.46	.52	.44	.46	.49	.48	.52	.02

Table 4 (continued)

Grade 5

School Type and Number	Test Time 1 October	2	3	4	5	6	7	8 May	Gain
	10 Applications								
IGE/DMP									
440	.17	.25	.20	.19	.19	.19	.24	.23	.06
593	.23	.14	.20	.23	.30	.17	.21	.26	.03
MEAN	.20	.20	.20	.21	.24	.18	.22	.24	.04
IGE/Non-DMP									
428	.20	.22	.19	.13	.21	.25	.26	.27	.07
333	.23	.19	.22	.31	.31	.22	.16	.27	.04
MEAN	.22	.20	.20	.22	.26	.24	.21	.27	.06
Non-IGE/DMP									
905	.07	.18	.19	.15	.16	.17	.21	.17	.10
906	.15	.15	.18	.24	.28	.27	.29	.31	.16
MEAN	.11	.16	.18	.20	.22	.22	.25	.24	.13

440, 593, and 906--was a convex curve with a rise followed by a plateau or decline. School 428, however, made an interesting gain of 20 percentage points between Test Time 7 and 8. The pattern of achievement for School 905 fluctuated over the last four test times showing some inconsistency. Achievement in School 333 was generally declining resulting in the only negative gain score. The final level of achievement for each group and for individual schools was very similar averaging .75.

Division (03). School 333 had an initial level of achievement (.60) much higher than the other schools. The other schools' initial level of achievement was around .35, except for School 905. All of the schools had positive gain scores and all of the schools reached their maximum level of achievement at a test time other than Test Time 8. Final achievement (Test Time 8) varied among the schools with the highest and the lowest scores occurring for the two IGE/DMP schools.

Fractions--Concept (04). The DMP schools generally scored higher on this objective at Test Time 1. In contrast to the previous objective, division, five of the six schools had their highest level of achievement at Test Time 8. The mean gain scores for the groups were similar. Thus, the two groups, IGE/DMP and non-IGE/DMP, maintained a slight achievement advantage at the end of the investigation period.

Fractions--Computation (05). Achievement at all schools throughout the test period on Fractions-Computation was quite low. Four schools

posted 15 to 22 point gains by the end of the investigation, while two (Schools 593 and 333) gained less than 10 points. Scores at School 906 were generally higher than at the other schools. At each school there was a gain of at least 10 points over some test period following Test Time 4. St School 906 this pattern is especially marked, with a gain of 24 points between Test Times 5 and 6. At all the schools the data show a plateau or slight decline following the period of greatest gain, except when the gain appears at Test Time 8 and no further data were gathered.

Decimal Fractions-Concept (06). The schools within each group varied noticeably. The pattern of achievement generally fluctuated over the eight test times. Only for School 440 was the achievement fairly constant until Test Time 8 when there was an increase of .17 for a total gain of .19. The other schools, except for School 428, all had positive gains but were generally below .10.

Decimal Fractions-Computation (07). The schools varied greatly at Test Time 1. The two IGE/DMP schools nearly represented the two extremes. With only slight rising and falling, the achievement patterns were increasing over the eight test times, except for School 333 which had a zero gain. The two schools with the largest gain scores were both DMP schools, 593 and 906.

Word Problems (09). The variation within groups and between the three groups were large. The achievement patterns over the eight test

times also varied by school. The gain scores were similar for the IGE schools but lower for the non-IGE/DMP schools. The final achievement, Test Time 8, reflected the initial achievement.

Applications (10). The scores on Test Time 1 were low with the highest score being only .23. The two groups, IGE/DMP and IGE/non-DMP, had similar mean scores on Test Time 1 which were higher than the mean score for non-IGE/DMP. However, the two non-IGE/DMP schools made the largest gains so that achievement at Test Time 8 was similar among all the schools. A high level of achievement was not reached by any of the schools.

Domain Referenced Tests

The mean, standard deviations, and Hoyt reliability estimates for all schools combined are given in Table 7. As reported above, data could not be collected for Grade 5 at three of the six schools at Test Time 4. No data are reported for Grade 5, Test Time 4. Data are also not available from 2 schools for Grade 2 at Test Time 4.

Table 5 reports the item difficulty and the domain difficulty for the three objectives tested at Grade 2. The same information is reported for Grade 5 in Table 6. In interpreting the data, a higher $\hat{K}$ indicates that the students understood the underlying concepts of the objective. A low $\hat{K}$--such as for School 333, Grade 2 for subtest 2, test time 1 and 4--indicates that the students generally had difficulty with the objective. The item difficulty index provides an indication of the relative difficulty of each item for each test time. The product of the item index and $\hat{K}$ is approximately the proportion of students answering the item correctly. Different items were given each test time so that the item numbers at different test times do not correspond.

Table 5

Item and Domain Indices for the Domain Referenced Tests
Grade 2 Mathematics

Subtest 1

Counts Numbers 0-99 (Compact Notation)

Item Number	IGE/DMP 440	IGE/DMP 593 [a]	IGE/non-DMP 428	IGE/non-DMP 421	IGE/non-DMP 333	Non-IGE/DMP 904	Non-IGE/DMP 906	Non-IGE/DMP 762 [a]
Test Time 1								
1	39	55	40	72	66	33	84	31
2	63	56	47	76	66	52	77	59
3	47	72	58	35	72	36	39	64
4	43	73	66	66	61	83	77	51
5	71	70	71	77	89	72	85	83
6	29	59	29	61	65	44	76	51
7	46	65	52	60	58	51	49	42
8	60	69	63	59	73	44	62	72
9	39	65	52	46	42	52	25	47
10	37	65	47	55	51	89	50	54
$\hat{K}$	.70	.91	.74	.74	.84	.78	.77	.80
Test Time 4								
1	48		68	.85	88	97	81	
2	68		76	73	84	86	70	
3	70		69	86	91	92	79	
4	18		17	33	39	47	36	
5	53		57	83	97	92	80	
6	80		74	81	89	92	77	
7	80		96	81	95	93	86	
8	57		48	38	75	64	58	
9	92		93	92	99	96	92	
10	81		81	78	85	90	73	
$\hat{K}$	.86		.88	.91	.98	.90	.98	
Test Time 8								
1	78	88	78	89	92	84	87	83
2	89	92	78	88	89	88	75	91
3	16	43	26	27	42	29	27	42
4	62	79	48	52	65	51	45	69
5	74	72	58	69	79	67	76	81
6	82	88	63	68	76	68	60	61
7	89	99	71	88	87	72	85	68
8	76	84	92	83	98	79	91	99
9	1.00	97	97	99	1.00	99	96	1.00
10	83	98	1.00	95	95	88	1.00	99
$\hat{K}$	.98	.99	.95	.97	.98	.94	.99	.97

Table 5 (continued)

Subtest 2

Writes Joining or Separating Sentence 0-99

Item Number	IGE/DMP 440	IGE/DMP 593[a]	IGE/non-DMP 428	IGE/non-DMP 421	IGE/non-DMP 333	Non-IGE/DMP 904	Non-IGE/DMP 906	Non-IGE/DMP 762[a]
Test Time 1								
1	04	39	09	00	85	16	00	10
2	60	48	91	00	67	76	92	81
3	01	39	18	00	85	08	00	13
4	30	48	05	00	21	00	00	.00
5	88	88	97	00	41	78	75	72
6	00	31	11	00	21	31	00	00
7	61	73	48	00	21	34	24	46
8	04	34	16	00	21	29	15	00
9	13	43	12	00	21	13	07	09
10	21	19	27	00	.00	15	13	19
$\hat{K}$	.64	.80	.87	.00	.15	.75	.70	.33
Test Time 4								
1	37		54	65	46	57	41	
2	21		12	40	75	59	37	
3	48		46	37	86	28	37	
4	29		24	45	57	85	60	
5	66		76	86	72	80	72	
6	49		24	85	74	41	30	
7	50		44	76	82	56	44	
8	52		78	81	72	94	91	
9	55		09	62	35	61	56	
10	44		50	79	72	38	29	
$\hat{K}$	.74		.88	.70	.15	.87	.84	
Test Time 8								
1	38	86	77	94	55	60	78	42
2	76	91	82	88	69	51	92	62
3	43	74	21	41	27	77	72	53
4	76	92	67	72	56	67	64	59
5	69	94	80	84	74	68	73	63
6	86	1.00	87	92	98	90	94	70
7	63	89	72	77	74	55	92	41
8	59	77	21	34	39	79	69	34
9	60	89	25	41	48	81	73	55
10	62	67	28	36	50	74	69	50
$\hat{K}$	.67	.95	.85	.86	.67	.86	.61	.62

Table 5 (continued)

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Subtest 3

Solves Open Sentence 0-20

Item Number	IGE/DMP 440	IGE/DMP 593 [a]	IGE/non-DMP 428	IGE/non-DMP 421	IGE/non-DMP 333	Non-IGE/DMP 904	Non-IGE/DMP 906	Non-IGE/DMP 762 [a]
Test Time 1								
1	58	80	69	53	78	82	75	53
2	23	50	02	14	16	37	48	02
3	46	50	36	47	55	63	52	00
4	21	37	05	12	06	08	08	10
5	41	62	27	47	39	78	28	38
6	28	49	50	52	62	50	35	24
7	74	76	72	88	84	96	76	60
8	52	82	66	77	66	82	22	26
9	40	63	41	43	51	66	13	36
10	74	89	98	87	90	97	48	52
$\hat{K}$	.65	.89	.91	.80	.88	.89	.58	.45
Test Time 4								
1	89		86	85	94	84	1.00	
2	72		93	87	97	76	89	
3	56		69	42	80	69	80	
4	46		43	30	46	35	39	
5	78		87	46	90	91	80	
6	20		18	14	15	50	31	
7	09		00	00	04	10	24	
8	24		56	50	81	70	52	
9	73		60	52	67	68	65	
10	64		82	63	92	92	80	
$\hat{K}$	.70		.86	.78	.96	.86	.81	
Test Time 8								
1	89	99	91	92	1.00	94	97	90
2	90	99	1.00	83	92	97	94	1.00
3	55	78	48	47	77	54	69	68
4	73	87	68	68	90	82	84	54
5	68	95	86	83	79	76	87	79
6	82	85	74	91	89	73	82	74
7	32	65	21	46	33	16	37	34
8	49	83	77	68	72	68	72	61
9	79	94	98	90	96	78	87	71
10	60	87	81	83	89	65	68	76
$\hat{K}$	.82	.96	.95	.93	.96	.91	.81	.83

[a] Data not available for Test Time 4.

Table 6

Item and Domain Indices for the Domain Referenced Tests
for Grade 5 Mathematics

Subtest 1

Finds Product 0-9,999

Item Number	IGE/DMP 440	IGE/DMP 593	IGE/non-DMP 428	IGE/non-DMP 333	Non-IGE/DMP 905	Non-IGE/DMP 906
Test Time 1						
1	.95	.93	.88	.95	90	.85
2	.82	.91	.75	.96	86	.91
3	.94	.95	.76	.97	82	.95
4	.75	.65	.65	.92	26	.67
5	.85	.92	.89	.88	70	.92
6	.81	.71	.72	.92	53	.83
7	.73	.71	.63	.86	34	.70
8	.71	.87	.79	.91	47	.65
9	.78	.71	.68	.83	52	.82
10	.78	.73	.54	.83	44	.69
$\hat{K}$	.78	.92	.70	.92	77	.85
Test Time 8						
1	.94	.96	.97	.98	.97	.80
2	.93	88	.83	.84	.79	.96
3	.69	98	.82	.87	.94	.92
4	.81	96	.98	.93	.93	.90
5	.95	91	.86	.94	.90	.92
6	.82	89	.76	.86	.81	.80
7	.82	84	.93	.91	.86	.77
8	.75	92	.86	.76	.74	.67
9	.73	88	.76	.87	.61	.73
10	.92	95	.87	.84	.80	.92
$\hat{K}$	.91	99	.98	.95	.96	.94

Table 6 (continued)

Subtest 2

Finds Equivalent Common Fraction or Mixed Number

Item Number	IGE/DMP 440	IGE/DMP 593	IGE/non-DMP 423	IGE/non-DMP 333	Non-IGE/DMP 905	Non-IGE/DMP 906
Test Time 1						
1	.87	.91	.91	.78	82	.98
2	.42	.67	.47	.59	33	.95
3	.86	.92	.88	.90	82	.98
4	.20	.00	.00	.27	00	.87
5	.73	.34	.62	.50	32	.89
6	.06	.00	.00	.36	00	.91
7	.35	.51	.73	.66	27	.89
8	.06	.06	.09	.39	00	.89
9	.64	.48	.50	.49	18	.80
10	.06	.00	.00	.20	00	.80
$\hat{K}$	.48	.59	.54	.54	.47	.93
Test Time 8						
1	.88	.86	.92	.75	.54	.97
2	.90	.65	.85	.81	91	.96
3	.94	.78	.82	.93	80	.98
4	.89	.96	.97	.81	75	.90
5	.96	.56	.98	.84	95	.97
6	.88	.62	.67	.58	88	.96
7	.54	.81	.80	.71	53	.94
8	.85	.46	.88	.57	88	.93
9	.73	.25	.77	.53	74	.94
10	.72	.34	.60	.60	81	.90
$\hat{K}$	.96	.82	.95	.71	.79	.92

Table 6 (continued)

Subtest 3

Divides by 1-digit Number

Item Number	IGE/DMP 440	IGE/DMP 593	IGE/non-DMP 428	IGE/non-DMP 333	Non-IGE/DMP 905	Non-IGE/DMP 906
			Test Time 1			
1	.95	.81	.90	.94	.75	.93
2	.77	.67	.90	.87	.75	.80
3	.51	.84	.90	.80	1.00	.92
4	.79	.81	.90	.85	.75	.77
5	.83	.74	1.00	.80	1.00	.95
6	.91	.76	.90	.92	1.00	.95
7	.85	.72	1.00	.88	.75	.97
8	.51	.52	.90	.77	.75	.72
9	.76	.62	.69	.88	.75	.89
10	.53	.61	.90	.71	.75	.51
$\hat{K}$	.45	.28	.12	.75	.06	.35
			Test Time 8			
1	.89	.98	.91	.97	86	.94
2	.82	.95	.86	.94	76	.92
3	.77	.89	.84	.82	78	.71
4	.84	.93	.92	.86	87	.92
5	.92	.95	.92	.94	79	.98
6	.82	.85	.82	.90	56	.80
7	.70	.96	.78	.78	73	.89
8	.60	.69	.70	.64	59	.68
9	.84	.91	.81	.92	87	.92
10	.79	.90	.84	.79	61	.76
$\hat{K}$	.77	.97	.89	.90	.77	.88

Table 7

Means, Standard Deviations, and Hoyt Reliabilities for Domain Referenced Tests for all Schools Combined

	Test Time 1 Subtest			Test Time 4* Subtest			Test Time 8 Subtest		
	1	2	3	1	2	3	1	2	3
Grade 2									
Mean	4.30	2.17	3.47	6.67	4.10	4.08	7.28	5.49	6.02
Standard Deviation	2.58	1.96	2.37	2.23	2.76	2.35	1.70	3.03	2.40
Hoyt Reliability	.73	.71	.75	.69	.79	.74	.49	.85	.77
Grade 5									
Mean	6.48	3.19	2.78				8.10	6.84	6.45
Standard Deviation	3.20	3.08	3.64				2.09	3.01	2.88
Hoyt Reliability	.87	.87	.95				.72	.86	.87

*Note: No data for Grade 5 at Test Time 4.

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APPENDIX A

Achievement Monitoring Tests
Comparative Study

Grade 2

Included in this appendix are the four test forms administered to the Grade 2 students in the math part of the Comparative Study.

IGE Evaluation
Phase IV
October 1978

Directions for Administering Math Inventories A, B, C, and D to Grade 2 Students

IDENTIFICATION INFORMATION[1]

On each booklet cover there are blanks for identification information. You will need to enter both the child's name and ID number prior to testing. The blanks for "Month" and "School" can be filled in either before or after testing.

GENERAL DIRECTIONS FOR ALL FORMS

Give each child a test booklet and a sharpened pencil with an eraser. Be sure each child has a ruler (metric ruler for inventories A and B; ruler in inches for inventories C and D). If children are to enter identification information, ask them to do it at this time.

SAY: Today I have some problems for you to work. Some of the problems will be about things you already know. Some of the problems may be new to you.

You will mark all of your answers by circling the letter next to the answer you choose. Look at the example in the box. How many fish are there? *[Wait for a response.]* That's right. There are 3 fish. A circle has been drawn around the B next to 3, the correct answer choice.

You will mark the rest of your answers in the same way. When you don't understand a problem, you don't have to answer it. When you're not sure of an answer, mark the answer you <u>think</u> is right.

For the next problems you will do your own work. Do not say your answers out loud.

Turn to the page with the large A in the corner.

Turn to the directions for the form you are administering.

[1]Revised November 1, 1978.

Instructions
Math Inventory
Grade 2
Form A

Form (A)

Directions for Administering Form A

Check to see that each child is on page A.

Wait until children have completed an item before proceeding to the next item.

Page A:

SAY: *(1)* Look at the flowers at the top of the page. How many flowers are there? [*Pause.*] Circle the letter next to the number that tells how many flowers there are.

(2) Now look at the apples. How many apples are there? [*Pause.*] Circle the letter next to the number that tells how many apples there are.

(3) Now look at the counting sticks. On the left it tells how many counting sitcks there are in each bundle. How many counting sticks are in the box? [*Pause.*] Circle the letter next to the number that tells how many counting sticks there are in the box.

Page B:

SAY: Turn to page B. [*Demonstrate. Check to see that each child is on the correct page.*] At the top of the page is another example. We will do this problem together.

Look at the squares. These squares have been grouped. What is the grouping notation that tells how the squares have been grouped? [*Wait for a response.*] That's right. Four groups of two with one left over, answer choice B, tells how the squares have been grouped. The letter B has been circled.

Now you will do more problems. Remember to keep your answers to yourself.

(4) Look at the baseballs. The baseballs have been grouped. Which grouping notation tells how the baseballs have been grouped? [*Pause.*] Circle the letter next to the grouping notation that tells how the baseballs have been grouped.

(5) Now look at the numbers. Which three numbers are in order from smallest to largest? [*Pause.*] Circle the letter next to the numbers that are in order from smallest to largest.

Page C:

SAY: Turn to page C. [*Demonstrate. Check to see that each child is on the correct page.*]

(6) At the top of the page is a story. You will choose the number sentence that tells about the story. Read the story silently as I read it aloud.

91 birds were in a tree. Some of the birds flew away. Now there are 55 birds in the tree. How many flew away?

Which sentence tells about the story? [*Pause.*] Circle the letter next to the sentence that tells about the story.

Now we'll do another problem together. Look at the number sentence--two plus one equals ☐ . Solve the number sentence. What number goes in the box? [*Wait for a response.*] That's right. 3, answer choice C, goes in the box. The letter C has been circled.

(7,8,9,) Solve the rest of the number sentences on this page by yourself. For each sentence, circle the letter next to the number that goes in the box. When you are finished, please put down your pencil. [*Wait for all students to finish the page.*]

Page D:

SAY: Now pick up your pencil and turn to page D. [*Demonstrate. Check to see that each child is on the correct page.*]

(10) At the top of the page is an addition problem. What is the sum? [*Pause.*] Circle the letter next to the sum.

(11) The next problem is a subtraction problem. What is the difference? [*Pause.*] Circle the letter next to the difference.

(12) Look at the sets of triangles. Which picture shows three-thirds of the set shaded? [*Pause.*] Circle the letter next to the picture that shows three-thirds of the set shaded.

(13) Now look at the rectangle. Is this rectangle divided into halves? [*Pause.*] Circle the letter next to the word that tells whether this rectangle is divided into halves.

Page E:

SAY: Now turn to page E. [*Demonstrate. Check to see that each child is on the correct page.*]

(14) Look at the bar at the top of the page. Use a ruler to measure the length of the bar in centimeters. How long is the bar? [*Pause.*] Circle the letter next to the number that tells how long the bar is.

(15) Below the bar is a story. You will choose the answer to the question at the end of the story. Read the story silently as I read it aloud.

Lisa bought 16 pieces of gum in the morning. She bought 5 pieces of gum in the afternoon. How many more pieces did she buy in the morning than in the afternoon?

Which number tells how many more pieces she bought in the morning than in the afternoon? [*Pause.*] Circle the letter for your answer choice.

(16) Now look at the next story. You will choose the answer to the question at the end of the story. Read the story silently as I read it aloud.

Judy had 13 apples in a box. She put some more in the box. Now she has 19 apples in the box. How many more apples did she put in the box?

Which number tells how many more apples she put in the box? [*Pause.*] Circle the letter for your answer choice.

(17) Now look at the story at the bottom of the page. You will choose the answer to the question at the end of the story. Read the story silently as I read it aloud.

Jules counted 26 birds in the yard. He saw 7 birds fly away and 10 more birds come into the yard. How many birds were there then in the yard?

Which number tells how many birds were there then in the yard? [*Pause.*] Circle the letter for your answer choice.

When all children have finished, collect test booklets.

Instructions
Math Inventory
Grade 2
Form B

Directions for Administering Form B

Check to see that each child is on page A.

Wait until children have completed an item before proceeding to the next item.

Page A:

SAY: *(1)* The question at the top of the page says "Which is the number seventeen?" [*Pause.*] Circle the letter next to the number seventeen.

(2) Now look at the blocks. How many blocks are there? [*Pause.*] Circle the letter next to the number that tells how many blocks there are.

(3) Now look at the counting sticks. On the left it tells how many counting sticks there are in each bundle. How many counting sticks are in the box? [*Pause.*] Circle the letter next to the number that tells how many counting sticks there are in the box.

Page B:

SAY: Turn to page B. [*Demonstrate. Check to see that each child is on the correct page.*] At the top of the page is another example. We will do this problem together.

Look at the squares. These squares have been grouped. What is the grouping notation that tells how the squares have been grouped? [*Wait for a response.*] That's right. Four groups of two with one left over, answer choice B, tells how the squares have been grouped. The letter B has been circled.

Now you will do more problems. Remember to keep your answers to yourself.

(4) Look at the blocks. The blocks have been grouped. Which grouping notation tells how the blocks have been grouped? [*Pause.*] Circle the letter next to the grouping notation that tells how the blocks have been grouped.

(5) Now look at the numbers. Which three numbers are in order from smallest to largest? [*Pause.*] Circle the letter next to the numbers that are in order from smallest to largest.

Page C:

SAY: Turn to page C. [*Demonstrate. Check to see that each child is on the correct page.*]

(6) At the top of the page is a story. You will choose the number sentence that tells about the story. Read the story silently as I read it aloud.

Mrs. Turner had 67 trees. 29 trees were pine trees and the rest were oak trees. How many trees were oak trees?

Which sentence tells about the story? [*Pause.*] Circle the letter next to the sentence that tells about the story.

Now we'll do another problem together. Look at the number sentence--two plus one equals ☐. Solve the number sentence. What number goes in the box? [*Wait for a response.*] That's right. 3, answer choice C, goes in the box. The letter C has been circled.

(7,8,9) Solve the rest of the number sentences on this page by yourself. For each sentence, circle the letter next to the number that goes in the box. When you are finished, please put down your pencil. [*Wait for all students to finish the page.*]

Page D:

SAY: Now pick up your pencil and turn to page D. [*Demonstrate. Check to see that each child is on the correct page.*]

(10) At the top of the page is an addition problem. What is the sum? [*Pause*] Circle the letter next to the sum.

(11) The next problem is a subtraction problem. What is the difference? [*Pause.*] Circle the letter next to the difference.

(12) Look at the stars. Which picture shows two-fifths of the star shaded? [*Pause.*] Circle the letter next to the picture that shows two-fifths of the star shaded.

(13) Now look at the rectangle. Is this rectangle divided into sixths? [*Pause.*] Circle the letter next to the word that tells whether this rectangle is divided into sixths.

Page E:

SAY: Now turn to page E. [*Demonstrate. Check to see that each child is on the correct page.*]

(14) Look at the bar at the top of the page. Use a ruler to measure the length of the bar in centimeters. How long is the bar? [*Pause.*] Circle the letter next to the number that tells how long the bar is.

(15) Below the bar is a story. You will choose the answer to the question at the end of the story. Read the story silently as I read it aloud.

There were 15 nuts in the box. Some nuts fell out. Now there are 9 nuts in the box. How many nuts fell out?

Which number tells how many nuts fell out? [*Pause.*] Circle the letter for your answer choice.

(16) Now look at the next story. You will choose the answer to the question at the end of the story. Read the story silently as I read it aloud.

Joe planted 47 seeds. 28 seeds were carrot seeds. The rest were pea seeds. How many were pea seeds?

Which number tells how many were pea seeds? [*Pause.*] Circle the letter for your answer choice.

Page F:

SAY: Now turn to page F. [*Demonstrate. Check to see that each child is on the correct page.*]

(17) Look at the picture of fruit at the top of the page. There is a story under the picture. You will choose the answer to the question at the end of the story. Read the story silently as I read it aloud.

(18) Teresa had 85 cents. She bought a bag of cranberries and a box of oranges. How many pounds of bananas can she buy with the money she has left?

Which number tells how mnay pounds of bananas Teresa can buy? [*Pause.*] Circle the letter for your answer choice.

When all children have finished, collect test booklets.

Instructions
Math Inventory
Grade 2
Form C

Directions for Administering Form C

Check to see that each child is on page A.

Wait until children have completed an item before proceeding to the next item.

Page A:

SAY: *(1)* Look at the oranges at the top of the page. How many oranges are there? [*Pause.*] Circle the letter next to the number that tells how many oranges there are.

(2) Now look at the marks. How many marks are there? [*Pause.*] Circle the letter next to the number that tells how many marks there are.

(3) Now look at the counting sticks. On the left it tells how many counting sticks there are in each bundle. How many counting sticks are in the box? [*Pause.*] Circle the letter next to the number that tells how many counting sticks there are in the box.

Page B:

SAY: Turn to page B. [*Demonstrate. Check to see that each child is on the correct page.*] At the top of the page is another example. We will do this problem together.

Look at the squares. These squares have been grouped. What is the grouping notation that tells how the squares have been grouped? [*Wait for a response.*] That's right. Four groups of two with one left over, answer choice B, tells how the squares have been grouped. The letter B has been circled.

Now you will do more problems. Remember to keep your answers to yourself.

(4) Look at the balloons. The balloons have been grouped. Which grouping notation tells how the balloons have been grouped? [*Pause.*] Circle the letter next to the grouping notation that tells how the balloons have been grouped.

(5) Now look at the numbers. Which three numbers are in order from smallest to largest? [*Pause.*] Circle the letter next to the numbers that are in order from smallest to largest.

Page C:

SAY: Turn to page C. [*Demonstrate. Check to see that each child is on the correct page.*]

(6) Look at the sets at the top of the page. Which sentence tells about finding the sum of the two sets? [*Pause.*] Circle the letter next to the sentence that tells about finding the sum of the two sets.

Now we'll do another problem together. Look at the number sentence--two plus one equals □. Solve the number sentence. What number goes in the box? [*Wait for a response.*] That's right. 3, answer choice C, goes in the box. The letter C has been circled.

(7,8,9,) Solve the rest of the number sentences on this page by yourself. For each sentence, circle the letter next to the number that goes in the box. When you are finished, please put down your pencil. [*Wait for all students to finish the page.*]

Page D:

SAY: Now pick up your pencil and turn to page D. [*Demonstrate. Check to see that each child is on the correct page.*]

(10) At the top of the page is an addition problem. What is the sum? [*Pause.*] Circle the letter next to the sum.

(11) The next problem is a subtraction problem. What is the difference? [*Pause.*] Circle the letter next to the difference.

(12) Look at the sets of circles. Which picture shows three-sixths of the set shaded? [*Pause.*] Circle the letter next to the picture that shows three-sixths of the set shaded.

(13) Now look at the flowers. Is this set divided into eighths? [*Pause.*] Circle the letter next to the word that tells whether this set is divided into eighths.

Page E:

SAY: Now turn to page E. [*Demonstrate. Check to see that each child is on the correct page.*]

(14) Look at the bar at the top of the page. Use a ruler to measure the length of the bar in centimeters. How long is the bar? [*Pause.*] Circle the letter next to the number that tells how long the bar is.

(15) Below the bar is a story. You will choose the answer to the question at the end of the story. Read the story silently as I read it aloud.

There were 25 ducks on the lake. There were also some geese. Then 9 geese flew away. Now there are the same number of geese on the lake as there are ducks. How many geese were on the lake at first?

Which number tells how many geese were on the lake at first? [*Pause.*] Circle the letter for your answer choice.

(16) Now look at the next story. You will choose the answer to the question at the end of the story. Read the story silently as I read it aloud.

Sorrel had 8 stamps. She bought 12 more. How many stamps does Sorrel have altogether?

Which number tells how many stamps Sorrel has altogether? [*Pause.*] Circle the letter for your answer choice.

Page F:

SAY: Now turn to page F. [*Demonstrate. Check to see that each child is on the correct page.*]

(17) Look at the addition box at the top of the page. There is a missing number. Which number is missing from the addition box? [*Pause.*] Circle the letter for your answer choice.

(18) Now look at the story at the bottom of the page. You will choose the answer to the question at the end of the story. Read the story silently as I read it aloud.

Nora, Jack, and Ivor each have some hamsters. Jack has 6 hamsters. Nora has 4 more hamsters than Jack. Together Jack, Nora, and Ivor have 23 hamsters. How many hamsters does Ivor have?

Which number tells how many hamsters Ivor has? [*Pause.*] Circle the letter for your answer choice.

When all children have finished, collect test booklets.

Instructions
Math Inventory
Grade 2
Form D

Directions for Administering Form D

Check to see that each child is on page A.

Wait until children have completed an item before proceeding to the next item.

Page A:

SAY: *(1)* Look at the black dots at the top of the page. How many black dots are there? [*Pause.*] Circle the letter next to the number that tells how many black dots there are.

(2) Now look at the straws. How many straws are there? [*Pause.*] Circle the letter next to the number that tells how many straws there are.

(3) Now look at the counting sticks. On the left it tells how many counting sticks there are in each bundle. How many counting sticks are in the box? [*Pause.*] Circle the letter next to the number that tells how many counting sticks there are in the box.

Page B:

SAY: Turn to page B. [*Demonstrate. Check to see that each child is on the correct page.*] At the top of the page is another example. We will do this problem together.

Look at the squares. These squares have been grouped. What is the grouping notation that tells how the squares have been grouped? [*Wait for a response.*] That's right. Four groups of two with one left over, answer choice B, tells how the squares have been grouped. The letter B has been circled.

Now you will do more problems. Remember to keep your answers to yourself.

(4) Look at the cans. The cans have been grouped. Which grouping notation tells how the cans have been grouped? [*Pause.*] Circle the letter next to the grouping notation that tells how the cans have been grouped.

(5) Now look at the numbers. Which three numbers are in order from smallest to largest? [*Pause.*] Circle the letter next to the numbers that are in order from smallest to largest.

Page C:

SAY: Turn to page C. [*Demonstrate. Check to see that each child is on the correct page.*]

(6) At the top of the page is a story. You will choose the number sentence that tells about the story. Read the story silently as I read it aloud.

77 motor boats were at the dock.
There were some sailboats there, too.
Then 34 sailboats sailed away.
Now there are the same number of
sailboats at the dock as there are
motorboats. How many sailboats were
there at first?

Which sentence tells about the story? [*Pause.*] Circle the letter next to the sentence that tells about the story.

Now we'll do another problem together. Look at the number sentence--two plus one equals ☐. Solve the number sentence. What number goes in the box? [*Wait for a response.*] That's right. 3, answer choice C, goes in the box. The letter C has been circled.

(7,8,9) Solve the rest of the number sentences on this page by yourself. For each sentence, circle the letter next to the number that goes in the box. When you are finished, please put down your pencil. [*Wait for all students to finish the page.*]

Page D:

SAY: Now pick up your pencil and turn to page D. [*Demonstrate. Check to see that each child is on the correct page.*]

(10) At the top of the page is an addition problem. What is the sum? [*Pause.*] Circle the letter next to the sum.

(11) The next problem is a subtraction problem. What is the difference? [*Pause.*] Circle the letter next to the difference.

(12) Look at the rectangles. Which picture shows one-fourth of the rectangle shaded? [*Pause.*] Circle the letter next to the picture that shows one-fourth of the rectangle shaded.

(13) Now look at the ice cream cones. Is this set divided into thirds? [*Pause.*] Circle the letter next to the word that tells whether this set is divided into thirds.

Form
(D)

Page E:

SAY: Now turn to page E. [*Demonstrate. Check to see that each child is on the correct page.*]

(14) Look at the bar at the top of the page. Use a ruler to measure the length of the bar in inches. How long is the bar? [*Pause.*] Circle the letter next to the number that tells how long the bar is.

(15) Below the bar is a story. You will choose the answer to the question at the end of the story. Read the story silently as I read it aloud.

There were some soccer players on the field.
23 more players came. Now there are 35 players
on the field. How many players were on the field
at first?

Which number tells how many players were on the field at first? [*Pause.*] Circle the letter for your answer choice.

(16) Now look at the next story. You will choose the answer to the question at the end of the story. Read the story silently as I read it aloud.

Anne had 43 baseball cards. She gave away 28.
How many baseball cards did Anne have left?

Which number tells how many baseball cards Anne had left? [*Pause.*] Circle the letter for your answer choice.

(17) Look at the chart at the bottom of the page. This chart tells about people's weight. How many pounds did Charlie gain? [*Pause.*] Circle the letter for your answer choice.

Page F:

SAY: Now turn to page F. [*Demonstrate. Check to see that each child is on the correct page.*]

(18) The chart on this page tells about rabbits, frogs, and mice. There is a story about the chart. You will choose the answer to the question at the end of the story. Read the story silently as I read it aloud.

Jerry took 2 of the mice home. One of the rabbits had
4 baby rabbits. How many animals are in the room now?

Which number tells how many animals are in the room now? [*Pause.*] Circle the letter for your answer choice.

When all children have finished, collect test booklets.

Form
(D)

2A

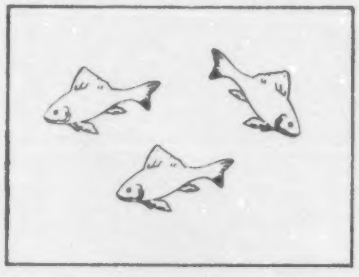
MATH INVENTORY

ID ___ ___ ___

MONTH _____

NAME _____ SCHOOL _____

EXAMPLE



A. 2
B. 3
C. 4
D. 5

IGE Evaluation
Phase IV
October 1978

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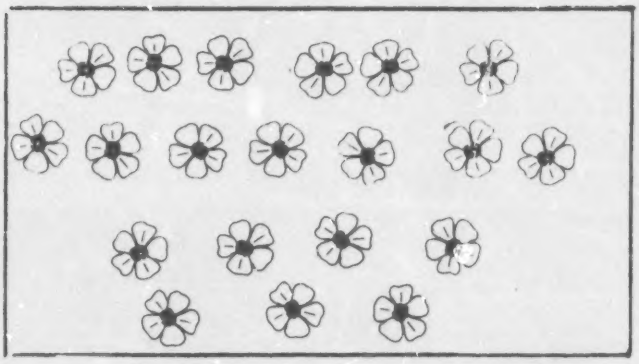
BEST COPY AVAILABLE

Center Contract No. OB-NIE-G-78-0217

A

1.



How many flowers?

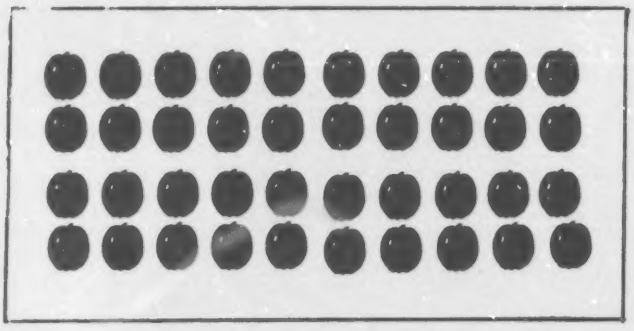
A. 02

B. 18

C. 20

D. 120

2.



How many apples?

A. 20

B. 39

C. 40

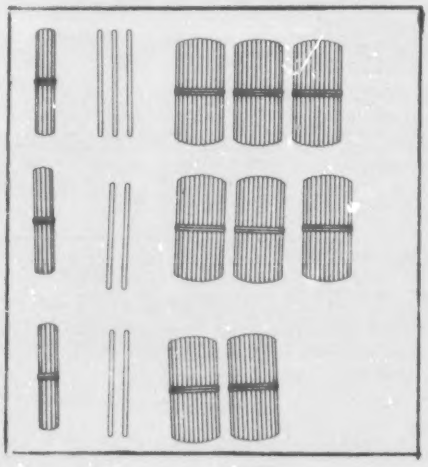
D. 41

3.

100 Counting Sticks

10 Counting Sticks

1 Counting Stick



How many counting sticks in the box?

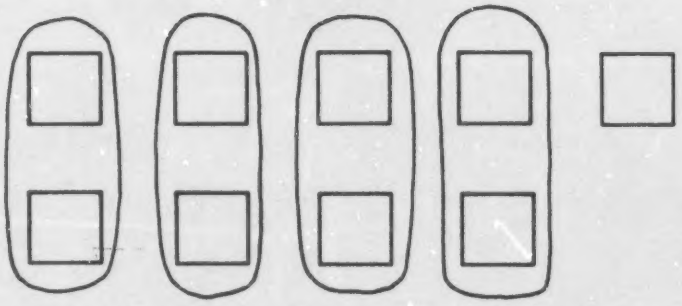
A. 107

B. 378

C. 822

D. 837

B



How many squares?

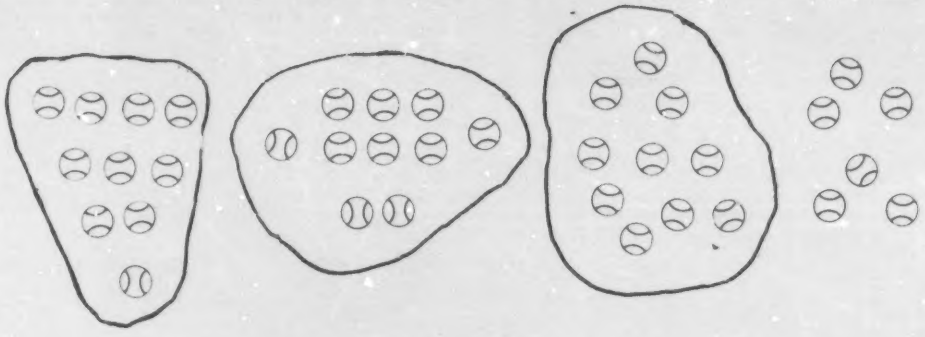
A. 4 + 2 + 1

B. 4(2) + 1

C. 4(1) + 2

D. 4 + 2

4.



How many baseballs?

A. 3(10) + 6

B. 3(5) + 1

C. 3(11) + 6

D. 3(6) + 10

5. Which numbers are in order from smallest to largest?

A. 674 478 768

B. 324 332 423

C. 69 97 72

D. 165 137 129

C

6. 91 birds were in a tree.
Some of the birds flew away.
Now there are 55 birds in the tree.
How many flew away?

A. 91 + ☐ = 55
B. 91 - ☐ = 55
C. 91 + 55 = ☐
D. 91 - 55 = ☐

---

2 + 1 = ☐

A. 1
B. 2
C. 3
D. 4

---

7. 2 + ☐ = 7

A. 4
B. 5
C. 7
D. 9

---

8. 14 - 8 = ☐

A. 5
B. 6
C. 7
D. 8

---

9. 56 = ☐ - 28

A. 84
B. 38
C. 32
D. 28

D

10. $\begin{array}{r} 53 \\ +34 \\ \hline \end{array}$

What is the sum?

A. 77

B. 87

C. 25

D. 85

---

11. $\begin{array}{r} 67 \\ -42 \\ \hline \end{array}$

What is the difference?

A. 109

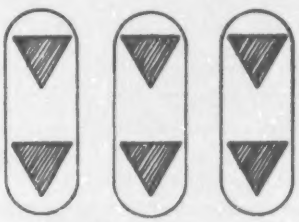
B. 32

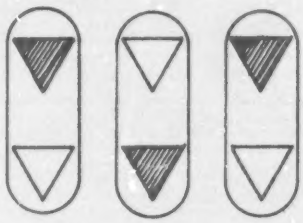
C. 29

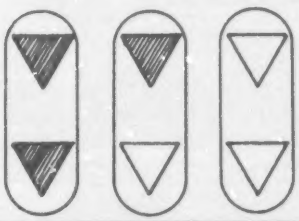
D. 25

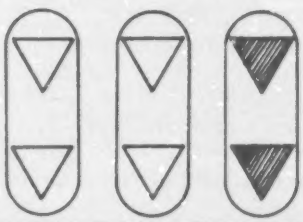
---

12. Which picture shows three-thirds of the set shaded?

A. 

C. 

B. 

D. 

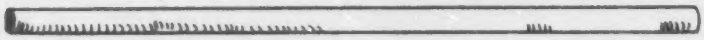
13.

Is this rectangle divided into halves?

A. yes

B. no

E

14. 

How long is the bar?

A. 4 cm.
B. 10 cm.
C. 11 cm.
D. 12 cm.

---

15. Lisa bought 16 pieces of gum in the morning. She bought 5 pieces of gum in the afternoon. How many more pieces did she buy in the morning than in the afternoon?

A. 21
B. 12
C. 11
D. 9

---

16. Judy had 13 apples in a box. She put some more in the box. Now she has 19 apples in the box. How many more apples did she put in the box?

A. 3
B. 6
C. 19
D. 31

---

17. Jules counted 26 birds in the yard. He saw 7 birds fly away and 10 more birds come into the yard. How many birds were there then in the yard?

A. 16
B. 19
C. 29
D. 36

F

18.

Which sentence could be true?

A. C weighs 6●

B. C weighs 9●

C. C weighs 12●

Phase IV, IGE Evaluation Project

October, 1978

Key, Test Time 1

Math Inventory Form 2A

1. C
2. C
3. D
4. A
5. B
6. B
7. B
8. B
9. A
10. B
11. D
12. A
13. A
14. B
15. C
16. B
17. C
18. A

2B

MATH INVENTORY

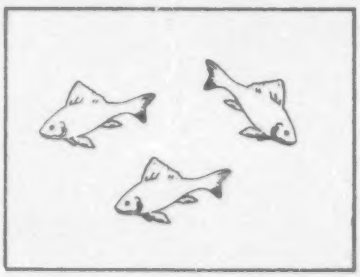
ID ___ ___ ___

MONTH/DAY

NAME

SCHOOL

EXAMPLE



A. 2

(B.) 3

C. 4

D. 5

IGE Evaluation
Phase IV
November 1978

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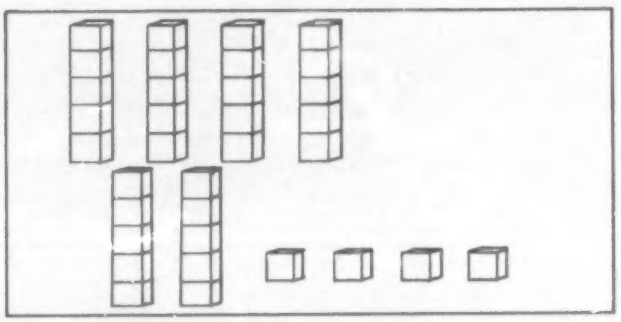
Center Contract No. OB-NIE-G-78-0217

A

1. Which is the number seventeen?

A. 71
B. 7
C. 17
D. 27

2.



How many blocks?

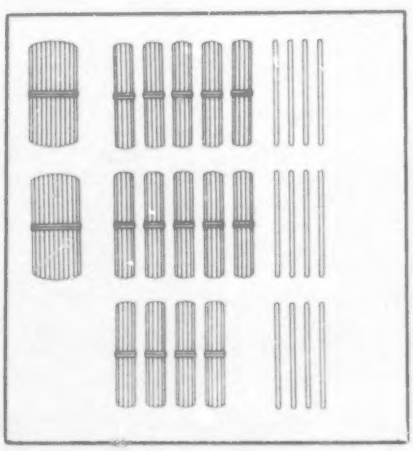
A. 24
B. 34
C. 36
D. 39

3.

100 Counting Sticks

10 Counting Sticks

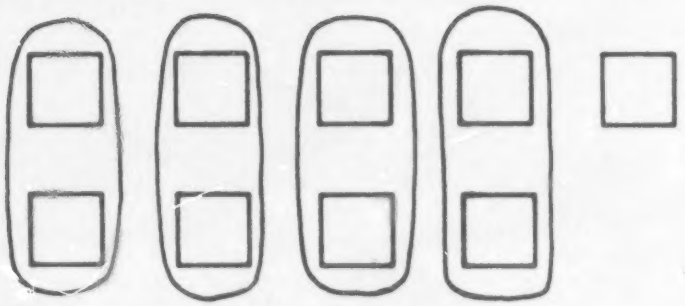
1 Counting Stick



How many counting sticks in the box?

A. 111
B. 154
C. 254
D. 352

B



How many squares?

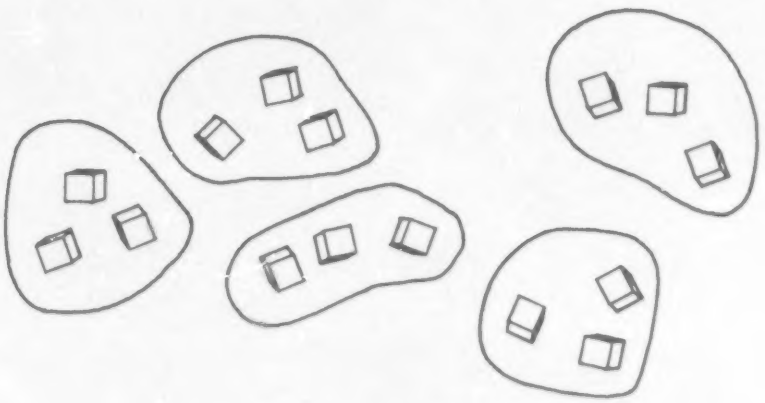
A. 4 + 2 + 1

B. 4(2) + 1

C. 4(1) + 2

D. 4 + 2

4.



How many blocks?

A. 5

B. 4(3) + 0

C. 3(5) + 2

D. 5(3) + 0

---

5. Which numbers are in order from smallest to largest?

A. 92 98 89

B. 63 37 57

C. 37 57 63

D. 28 82 36

C

6. Mrs. Turner had 67 trees. 29 trees were pine trees and the rest were oak trees. How many trees were oak trees?

A. 67 + 29 = ☐
B. 67 + ☐ = 29
C. 67 = ☐ - 29
D. 67 - 29 = ☐

---

2 + 1 = ☐

A. 1
B. 2
(C.) 3
D. 4

---

7. 4 = ☐ - 6

A. 2
B. 4
C. 8
D. 10

---

8. ☐ + 7 = 15

A. 6
B. 8
C. 9
D. 22

---

9. ☐ + 43 = 91

A. 44
B. 48
C. 58
D. 62

D

What is the sum?

10. 29
+64

A. 73
B. 83
C. 93
D. 813

What is the difference?

11. 73
-16

A. 50
B. 57
C. 63
D. 89

Which picture shows two-fifths of the star shaded?

12.

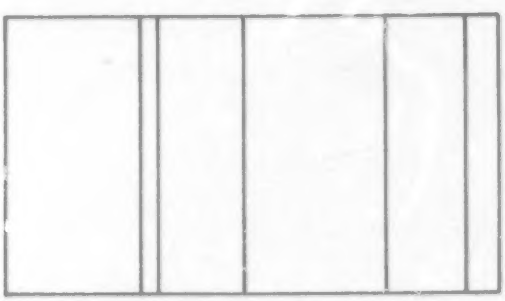
A.

B.

C.

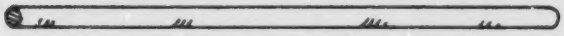
D.

---

13. 

Is this rectangle divided into sixths?

A. yes
B. no

14. 

How long is the bar?

A. 3 cm.
B. 7 cm.
C. 8 cm.
D. 9 cm.

---

15. There were 15 nuts in the box. Some nuts fell out. Now there are 9 nuts in the box. How many nuts fell out?

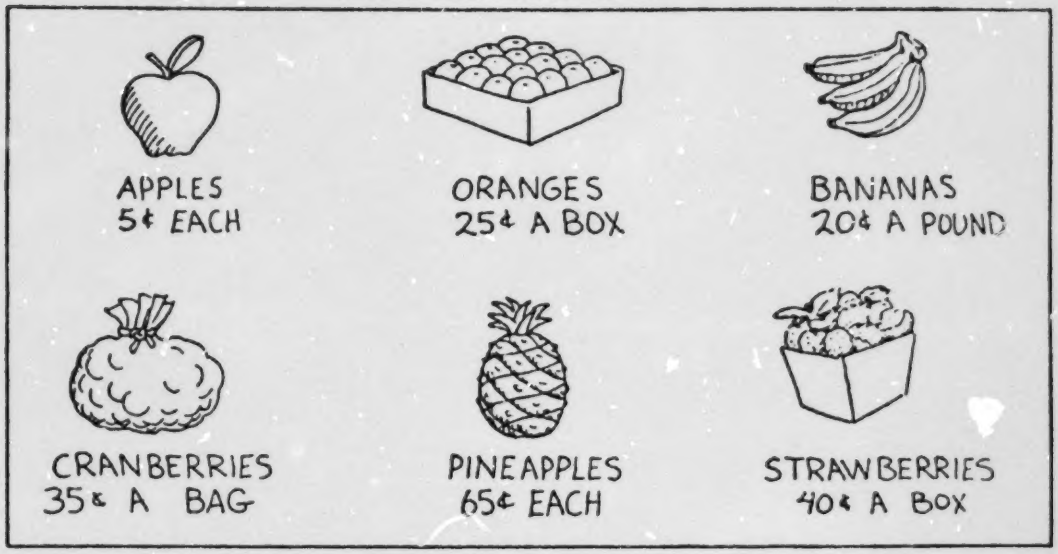
A. 6
B. 7
C. 9
D. 24

---

16. Joe planted 47 seeds. 28 seeds were carrot seeds. The rest were pea seeds. How many were pea seeds?

A. 75
B. 65
C. 21
D. 19

17.



Teresa had 85 cents. She bought a bag of cranberries and a box of oranges. How many pounds of bananas can she buy with the money she has left?

A. 0

B. 1

C. 2

D. 3

---

18. Herman bought 20 cookies. He gave some to Linda and had 8 left. How many cookies did he give Linda?

A. 8

B. 12

C. 16

D. 28

Phase IV, IGE Evaluation Project

October, 1978

Key, Test Time 1

Math Inventory Form 2B

1. C
2. B
3. D
4. D
5. C
6. D
7. D
8. B
9. B
10. C
11. B
12. C
13. B
14. C
15. A
16. D
17. B
16. B

2C

MATH INVENTORY

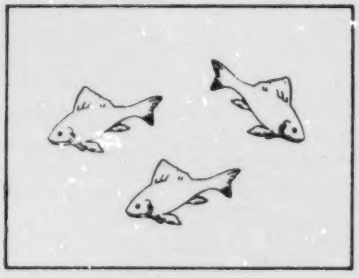
ID ___ ___ ___

MONTH

NAME

SCHOOL

EXAMPLE



A. 2

(B.) 3

C. 4

D. 5

IGE Evaluation
Phase IV
October 1978

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Center Contract No. OB-NIE-G-78-0217

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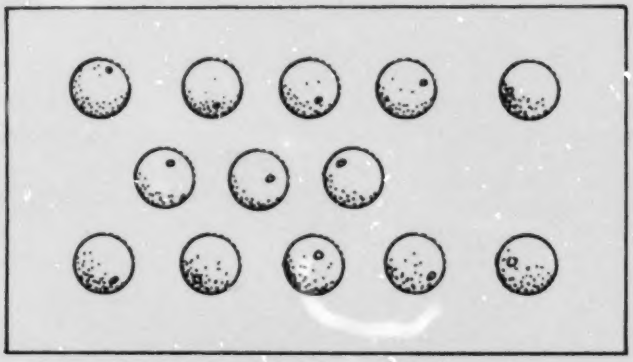
A

1.



How many oranges?

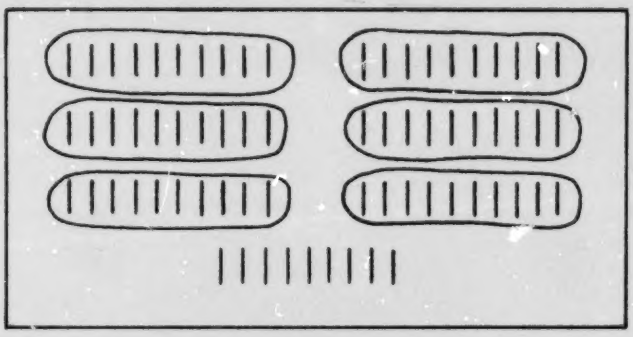
A. 11

B. 13

C. 14

D. 31

2.



How many marks?

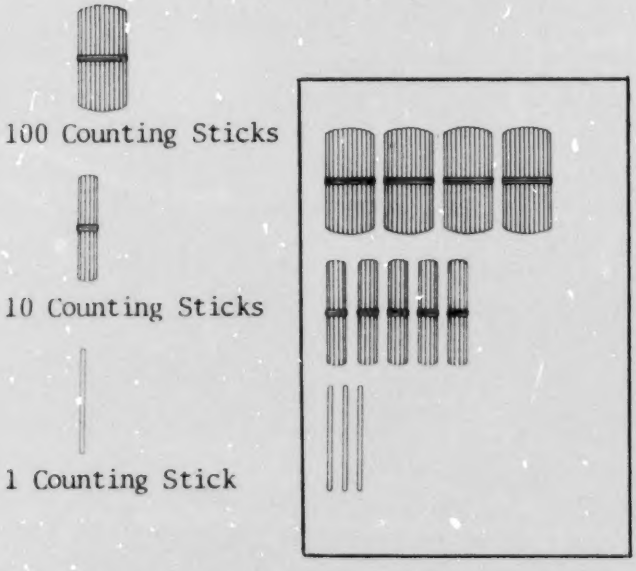
A. 67

B. 68

C. 69

D. 96

3.



How many counting sticks in the box?

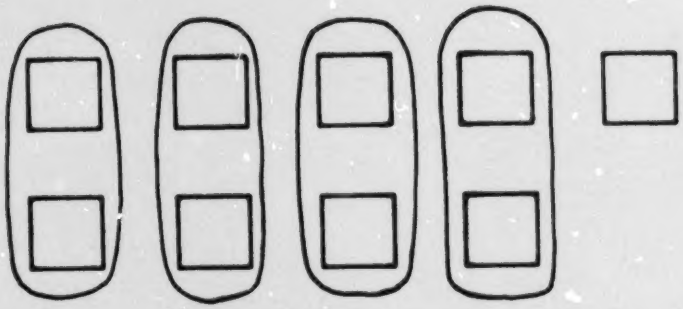
A. 153

B. 4,053

C. 543

D. 453

B



How many squares?

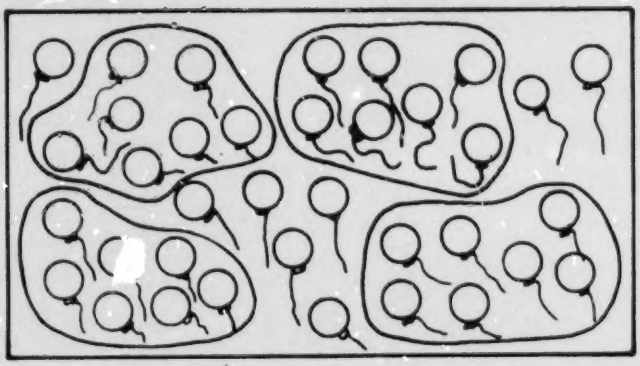
A. 4 + 2 + 1

(B.) 4(2) + 1

C. 4(1) + 2

D. 4 + 1

4.



How many balloons?

A. 4(7) + 8

B. 4(8) + 7

C. 4(7) + 7

D. 4(6) + 8

5. Which numbers are in order from smallest to largest?

A. 580 605 700

B. 290 284 488

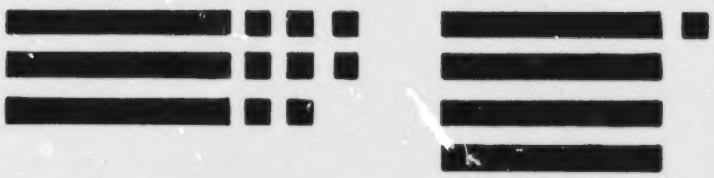
C. 82 64 37

D. 96 211 188

C

= 10

= 1

6. 

A. 3 + 4 = ☐

B. 38 + 41 = ☐

C. 11 + 5 = ☐

D. 38 + ☐ = 41

---

2 + 1 = ☐

A. 1

B. 2

C. 3

D. 4

---

7. ☐ - 6 = 3

A. 9

B. 3

C. 12

D. 2

---

8. 5 = 17 - ☐

A. 12

B. 11

C. 22

D. 9

---

9. 66 = ☐ + 27

A. 29

B. 33

C. 39

D. 93

D

What is the sum?

10. 36
+47

A. 73
B. 79
C. 83
D. 91

What is the difference?

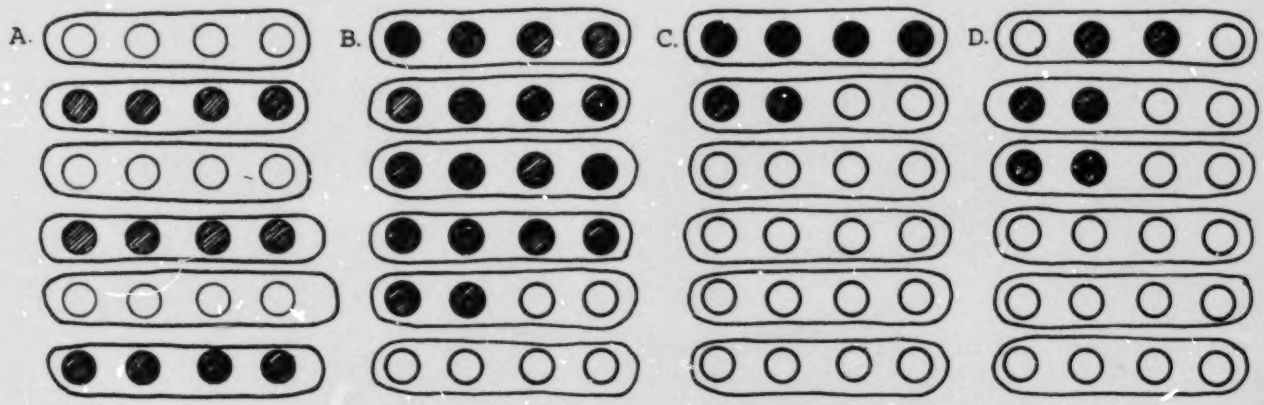
11. 85
-59

A. 34
B. 44
C. 61
D. 26

Which picture shows three-sixths of the set shaded?

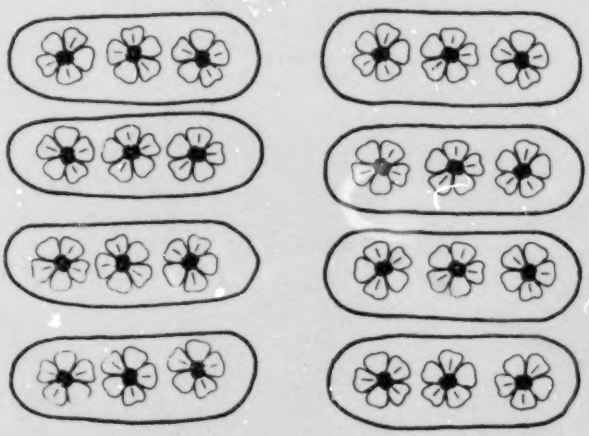
12.

A. B. C. D.



Is this set divided into eighths?

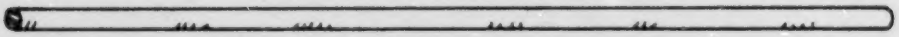
13.



A. yes
B. no

E

14. How long is the bar?



A. 5 in.
B. 13 in.
C. 4 in.
D. 14 in.

---

15. There were 25 ducks on the lake. There were also some geese. Then 9 geese flew away. Now there are the same number of geese on the lake as there are ducks. How many geese were on the lake at first?

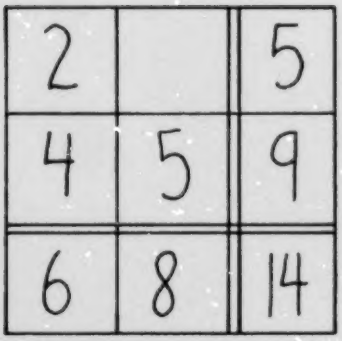
A. 14
B. 16
C. 34
D. 44

---

16. Sorrel had 8 stamps. She bought 12 more. How many stamps does Sorrel have altogether?

A. 24
B. 20
C. 10
D. 4

17.



What is the missing number in the addition box?

A. 2
B. 3
C. 4
D. 5
E. None of those numbers

---

18. Nora, Jack, and Ivor each have some hamsters. Jack has 6 hamsters. Nora has 4 more hamsters than Jack. Together Jack, Nora, and Ivor have 23 hamsters. How many hamsters does Ivor have?

A. 7
B. 13
C. 15
D. 33

Phase IV, IGE Evaluation Project

October, 1978

Key, Test Time 1

Math Inventory Form 2C

1. B
2. C
3. D
4. A
5. A
6. B
7. A
8. A
9. C
10. C
11. D
12. A
13. A
14. A
15. C
16. B
17. B
18. A

BEST COPY AVAILABLE

2D

MATH INVENTORY

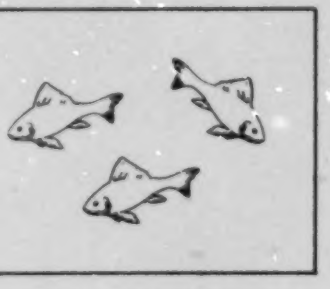
ID ___ ___ ___

MONTH

NAME

SCHOOL

EXAMPLE



A. 2

B. 3

C. 4

D. 5

IGE Evaluation
Phase IV
October 1978

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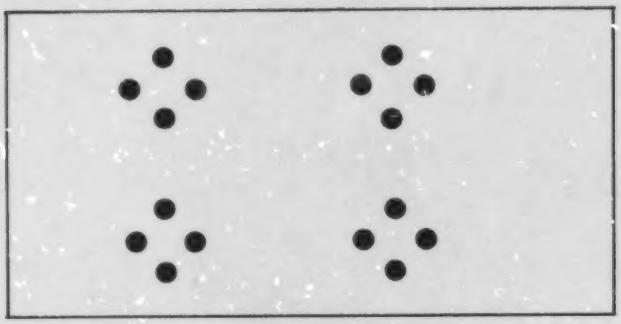
Center Contract No. OB-NIE-G-78-0217

A

1.



How many dots?

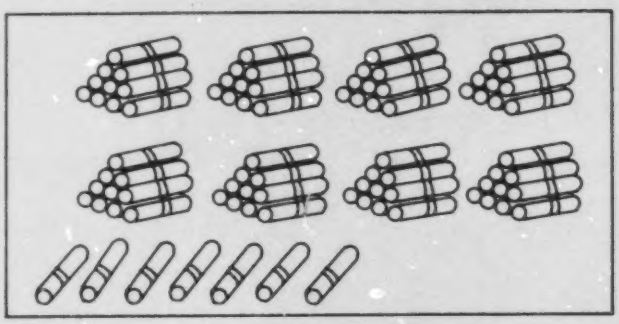
A. 18

B. 16

C. 14

D. 12

2.



How many straws?

A. 97

B. 87

C. 47

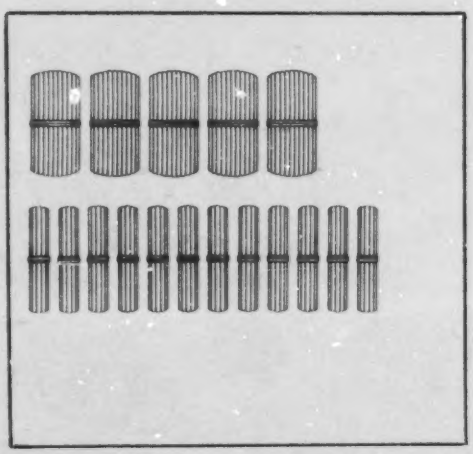
D. 15

3.

100 Counting Sticks

10 Counting Sticks

1 Counting Stick



How many counting sticks in the box?

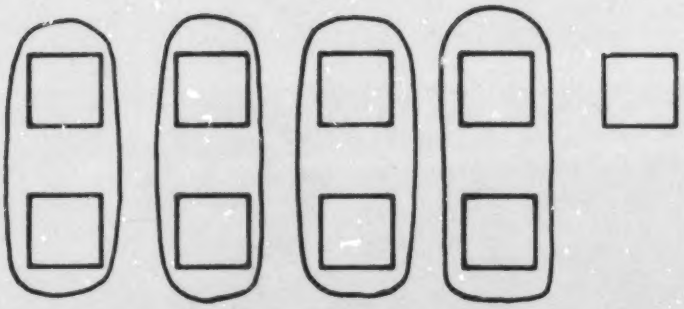
A. 17

B. 512

C. 602

D. 620

B



How many squares?

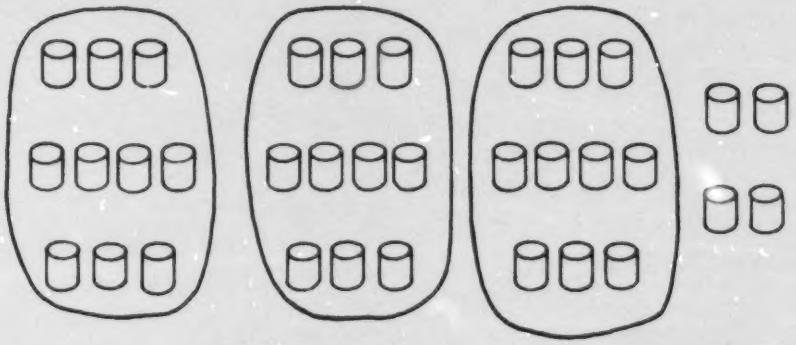
A. 4 + 2 + 1

B. 4(2) + 1

C. 4(1) + 2

D. 4 + 2

4.



How many cans?

A. 10

B. 3(10) + 4

C. 3(4) + 4

D. 3(4) + 10

5. Which numbers are in order from smallest to largest?

A. 109 99 119

B. 754 445 574

C. 882 298 929

D. 265 326 422

C

6. 77 motor boats were at the dock. There were some sailboats there, too. Then 34 sailboats sailed away. Now there are the same number of sailboats at the dock as there are motorboats. How many sailboats were there at first?

A. 77 - 34 = ☐
B. 77 - ☐ = 34
C. 77 = ☐ - 34
D. ☐ = 77 + 34

---

2 + 1 = ☐

A. 1
B. 2
C. 3
D. 4

---

7. 3 + 5 = ☐

A. 7
B. 8
C. 9
D. 10

---

8. 8 + 5 = ☐

A. 3
B. 12
C. 13
D. 14

---

9. 87 - ☐ = 35

A. 52
B. 42
C. 34
D. 25

D

What is the sum?

10. 16
+44

A. 60
B. 61
C. 50
D. 510

What is the difference?

11. 98
-29

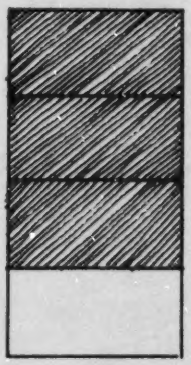
A. 69
B. 71
C. 67
D. 79

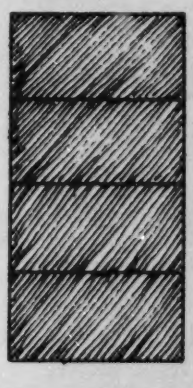
Which picture shows one-fourth of the rectangle shaded?

12.

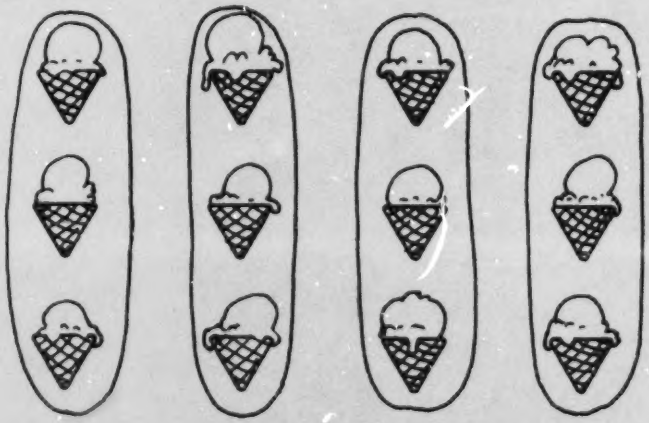
A.

B.

C. 

D. 

---

13. 

Is this set divided into thirds?

A. yes
B. no

E

14.

How long is the bar?

A. 1 in.
B. 2 in.
C. 3 in.
D. 6 in.

---

15. There were some soccer players on the field. 23 more players came. Now there are 35 players on the field. How many players were on the field at first?

A. 12
B. 18
C. 23
D. 58

---

16. Anne had 43 baseball cards. She gave away 28. How many baseball cards did Anne have left?

A. 71
B. 35
C. 25
D. 15

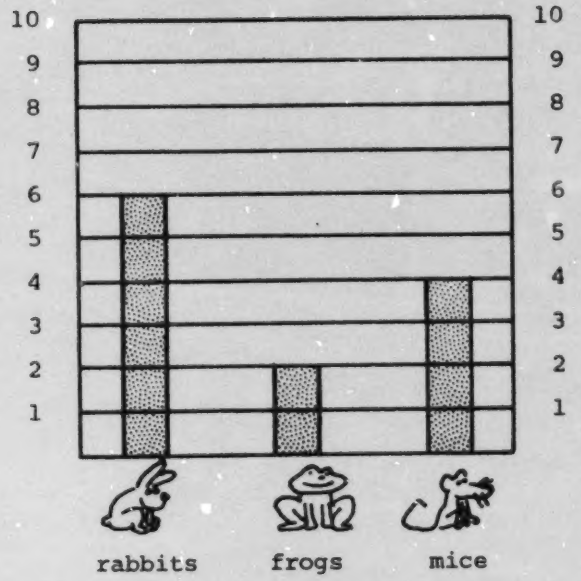
17.

WEIGHT IN POUNDS		
	August	May
Lucille	62	66
Charlie	70	81
Lloyd	73	82
Mary	55	69

How many pounds did Charlie gain?

A. 4
B. 9
C. 11
D. 12
E. 15

18.



Jerry took 2 of the mice home. One of the rabbits had 4 baby rabbits. How many animals are in the room now?

A. 10

B. 14

C. 16

D. 17

Phase Iv, IGE Evaluarion Project

October, 1978

Key, Test Time 1

Math Inventory Form 2D

1. B
2. B
3. D
4. B
5. D
6. C
7. B
8. C
9. A
10. A
11. A
12. A
13. B
14. B
15. A
16. D
17. C
18. B

APPENDIX B

Achievement Monitoring Tests
Comparative Study

Grade 5

Included in this appendix are the four test forms administered to the Grade 5 studies in the math part of the Comparative Study. Two versions of these tests were used. The first version, used for test time 1, did not include the correct answer among the choices for item 5 on form SF. This was correct on the second version of the tests. Also the instructions were changed to have the students respond on a machine scoreable form. The second version of the tests are included in this appendix.

IGE Evaluation
Phase IV
October 1978[1]

Directions for Administering Math Inventories E, F, G, and H to Grade 5 Students

Before the time of testing:

Write the name of each student in the group on the answer sheet form the group is to take. See general testing instructions for which group of students should take which form.

At the time of testing:

Distribute test booklets and answer sheets. Be sure that each student has the answer sheet with his or her name on it and has a sharpened No. 2 lead pencil with an eraser.

SAY: Your name has been written on the answer sheet. Please write in the month and day and your school name in the blanks provided. [*Wait for students to finish writing.*]

Read the directions on the cover of your booklet silently as I read them aloud to you.

This inventory asks you to find the answers to different kinds of number problems. Some problems will be familiar to you. Some problems you may not have seen before.

Look at example X in the box. [*Pause.*] What is the answer? [*Wait for a response.*] Right. Eight, answer choice C, is correct. Find the answer space for example X on your answer sheet. [*Point.*] Mark your answer to example X by filling in the white box below choice C. [*Check to see that students are marking the answer correctly.*]

Mark all answers on your answer sheet by filling in the box below your choice. Be sure that the question number on your answer sheet is the same as the question number in your test booklet. When you're not sure of an answer, mark the answer you think is right.

If you have any questions, raise your hand. [*Pause.*] When you come to the word Stop, check your work. Then close your booklet.

Turn the page and begin.

[1]Revised December 1978

5E

MATH INVENTORY

This inventory asks you to find the answers to different kinds of number problems. Some problems will be familiar to you. Some problems you may not have seen before.

EXAMPLE X

$5 + 3 = \square$

A. 6
B. 7
C. 8
D. 9

Mark all answers on your answer sheet by filling in the box below your choice. Be sure that the question number on your answer sheet is the same as the question number in your test booklet. When you're not sure of an answer, mark the answer you <u>think</u> is right.

Phase IV
IGE Evaluation
December 1978

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Center Grant No. OB-NIE-G-78-0217

1. $\frac{1}{4}$ =

A. $\frac{2}{8}$

B. $\frac{4}{8}$

C. $\frac{8}{8}$

D. $\frac{32}{8}$

2. $\frac{17}{6}$ =

A. $2\frac{5}{6}$

B. $2\frac{6}{6}$

C. $5\frac{2}{6}$

D. $3\frac{1}{6}$

3. $\frac{6}{8}$ =

A. .5

B. .66

C. 1.33

D. .75

4. 9 - .5 = $\square$

A. 8.5

B. 4

C. .4

D. 8.95

go on to the next page

5. $2.83 + .56 = \square$

A. 2.27

B. 3.39

C. 2.39

D. 339

6. $\frac{7}{10} - \frac{3}{10} = \square$

A. 4

B. $\frac{10}{10}$

C. $\frac{10}{20}$

D. $\frac{4}{10}$

7. $3 \times 2\frac{2}{3} = \square$

A. $5\frac{2}{3}$

B. $6\frac{2}{3}$

C. 8

D. 4

8. Which sentence is true?

A. $\frac{5}{8} < \frac{3}{4}$

B. $\frac{5}{8} > \frac{3}{4}$

C. $\frac{5}{8} = \frac{3}{4}$

go on to the next page

9. Henry used some rope to tie a knot. Carol used $2\frac{3}{4}$ feet of rope to make a ladder. Together they used $4\frac{1}{4}$ feet of rope. How many feet of rope did Henry use?

A. $2\frac{1}{2}$ feet

B. $1\frac{1}{2}$ feet

C. 7 feet

D. 3 feet

10. There are 78 people waiting to cross a river on a ferry. Each trip the ferry can carry 6 of them. How many trips will the ferry have to make?

A. 13

B. 12

C. 11

D. 10

go on to the next page

11. $\begin{array}{r} 2{,}438 \\ +\ 776 \\ \hline \end{array}$

A. 2,214
B. 3,214
C. 2,204
D. 3,204

12. $\begin{array}{r} 30 \\ \times\ 96 \\ \hline \end{array}$

A. 2,980
B. 2,880
C. 2,770
D. 450

13. $\begin{array}{r} 58 \\ \times\ 69 \\ \hline \end{array}$

A. 870
B. 3,902
C. 4,002
D. 4,102

14. $\begin{array}{r} 8{,}025 \\ \times\ 94 \\ \hline \end{array}$

A. 104,325
B. 752,250
C. 754,350
D. 754,650

15. $7\overline{)574}$

A. 8 r4
B. 81
C. 82
D. 802

16. $4\overline{)8{,}694}$

A. 2173 r2
B. 2121
C. 2173
D. 2183 r2

17. $\begin{array}{r} .37 \\ \times\ 5 \\ \hline \end{array}$

A. .0185
B. .185
C. 1.85
D. 18.5

go on to the next page

18. Four companies are selling oil to be used to heat houses. Thr price list for one gallon of oil is given below.

Company	Price
W	$ .481
X	.409
Y	.42
Z	.426

Which company has the lowest price?

A. Company W

B. Company X

C. Company Y

D. Company Z

19. A wholesaler supplies stores with large cartons of ping pong balls. Each carton contains 86 balls. A store manager buys 28 cartons and then has the ping pong balls packed into smaller boxes with 8 in a box. How many smaller boxes will the store manager need to have?

A. 31

B. 122

C. 224

D. 301

Stop

KEY MATH INVENTORY, FORM 5E EDITION

1. A
2. A
3. D
4. A
5. B
6. D
7. C
8. A
9. A
10. A
11. B
12. B
13. C
14. C
15. C
16. A
17. C
18. B
19. D

5F

MATH INVENTORY

This inventory asks you to find the answers to different kinds of number problems. Some problems will be familiar to you. Some problems you may not have seen before.

EXAMPLE X

$5 + 3 = \square$

A. 6
B. 7
C. 8
D. 9

Mark all answers on your answer sheet by filling in the box below your choice. Be sure that the question number on your answer sheet is the same as the question number in your test booklet. When you're not sure of an answer, mark the answer you <u>think</u> is right.

Phase IV
IGE Evaluation
December 1978

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Center Grant No. OB-NIE-G-78-0217

1. $\frac{12}{16}$ =

A. $\frac{4}{4}$

B. $\frac{2}{4}$

C. $\frac{4}{8}$

D. $\frac{3}{4}$

2. $\frac{19}{8}$ =

A. $2\frac{2}{8}$

B. $2\frac{0}{8}$

C. $2\frac{3}{8}$

D. $3\frac{3}{8}$

3. $\frac{5}{2}$ =

A. .4

B. .5

C. 2.5

D. 5.5

4. .803 - .075 = $\square$

A. 728

B. .828

C. .128

D. .728

go on to the next page

5. $4.7 + 2.6 = \square$

A. 7.3

B. 6.13

C. 4.33

D. .73

6. $\square - \frac{5}{12} = \frac{1}{3}$

A. $\frac{9}{12}$

B. $\frac{6}{12}$

C. $\frac{4}{12}$

D. $\frac{5}{4}$

7. $\frac{3}{4} \times 24 = \square$

A. 72

B. $\frac{24}{4}$

C. 16

D. 18

8. Which sentence is true?

A. $\frac{2}{3} > \frac{9}{12}$

B. $\frac{2}{3} = \frac{9}{12}$

C. $\frac{2}{3} < \frac{9}{12}$

go on to the next page

9. Susan used $\frac{1}{4}$ of the paint in a can. Jason used some more paint from the same can. If altogether they used $\frac{3}{4}$ of the paint in the can, how much of the paint did Jason use?

A. 1

B. $\frac{3}{4}$

C. $\frac{1}{2}$

D. $\frac{3}{8}$

10. In the gym there are 9 rows of chairs. Each row has the same number of chairs. There are 189 chairs. How many chairs are in each row?

A. 11

B. 21

C. 201

D. 1701

go on to the next page

11. $\begin{array}{r} 905 \\ +\ 639 \\ \hline \end{array}$

A. 1,634
B. 15,314
C. 1,534
D. 1,544

12. $\begin{array}{r} 87 \\ \times\ 96 \\ \hline \end{array}$

A. 1,305
B. 7,352
C. 8,352
D. 8,342

13. $\begin{array}{r} 50 \\ \times\ 38 \\ \hline \end{array}$

A. 1,900
B. 1,540
C. 550
D. 1,908

14. $\begin{array}{r} 3,194 \\ \times\ 290 \\ \hline \end{array}$

A. 35,134
B. 77,460
C. 916,260
D. 926,260

15. $8\overline{)68,032}$

A. 854
B. 8,004
C. 8,258
D. 8,504

16. $7\overline{)5,501}$

A. 780
B. 785 r5
C. 785 r6
D. 786

17. $\begin{array}{r} 7.4 \\ \times\ 8 \\ \hline \end{array}$

A. 5.92
B. 56.32
C. 59.2
D. 592

go on to the next page

18. Karen has 2 cups of lemonade. She gave $\frac{1}{3}$ cup of lemonade to Erica, $\frac{1}{2}$ cup to Marc, and $\frac{5}{6}$ cup to Carl. How much lemonade did Karen have left over?

A. $\frac{1}{3}$ cup

B. $\frac{5}{6}$ cup

C. $\frac{10}{6}$ cup

D. $1\frac{2}{3}$ cup

19. There are 24 beads on a necklace. The beads are red, blue, or yellow. $\frac{2}{3}$ of the beads are red. Two of the beads are blue. How many red beads are there?

A. 12

B. 16

C. 18

D. 20

Stop

KEY MATH INVENTORY, FORM 5F, OCTOBER 1978 EDITION

1. D
2. C
3. C
4. D
5. A*
6. A
7. D
8. C
9. C
10. B
11. D
12. C
13. A
14. D
15. D
16. C
17. C
18. A
19. B

* This item did not have a correct answer for the October 1978 testing. The answer choices were changed on the test copy originals 10/23/78.

5G

MATH INVENTORY

This inventory asks you to find the answers to different kinds of number problems. Some problems will be familiar to you. Some problems you may not have seen before.

EXAMPLE X

$5 + 3 = \square$

A. 6
B. 7
C. 8
D. 9

Mark all answers on your answer sheet by filling in the box below your choice. Be sure that the question number on your answer sheet is the same as the question number in your test booklet. When you're not sure of an answer, mark the answer you <u>think</u> is right.

Phase IV
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December 1978

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Center Grant No. OB-NIE-G-78-0217

1. $\frac{2}{3}$ =

A. $\frac{8}{9}$

B. $\frac{6}{9}$

C. $\frac{4}{9}$

D. $\frac{1}{9}$

2. $2\frac{4}{5}$ =

A. $\frac{14}{5}$

B. $\frac{9}{5}$

C. $\frac{6}{5}$

D. $\frac{4}{5}$

3. $\frac{2}{4}$ =

A. 5

B. 2

C. .25

D. .5

4. 4.6 - .24 = $\square$

A. 4.36

B. 2.2

C. 7

D. 22

go on to the next page

5. $5.1 + .9 + 8.4 = \square$

A. 13.14

B. 14.4

C. 1.44

D. .144

6. $\frac{2}{9} + \frac{1}{3} = \square$

A. $\frac{3}{12}$

B. $\frac{5}{9}$

C. $\frac{3}{9}$

D. 15

7. $\frac{5}{6} \times 5 = \square$

A. $\frac{25}{30}$

B. $\frac{10}{6}$

C. $8\frac{1}{6}$

D. $4\frac{1}{6}$

8. Which sentence is true?

A. $\frac{1}{2} < \frac{4}{9}$

B. $\frac{1}{2} > \frac{4}{9}$

C. $\frac{1}{2} = \frac{4}{9}$

go on to the next page

9. Karlyn had $\frac{5}{6}$ box of nails. She used some of the nails to build a dog house. Now she has $\frac{1}{2}$ box of nails. How many nails did she use to build the dog house?

A. $\frac{8}{6}$ box

B. $\frac{5}{4}$ box

C. $\frac{1}{3}$ box

D. $\frac{4}{4}$ box

10. Each box has the same number of radios in it. If there are 156 radios and 12 boxes, how many radios are in each box?

A. 12

B. 13

C. 103

D. 1872

Go on to the next page

11. $\begin{array}{r} 3,006 \\ +\ 2,498 \\ \hline \end{array}$

A. 5,504
B. 5,494
C. 54,104
D. 54,914

12. $\begin{array}{r} 82 \\ \times\ 4 \\ \hline \end{array}$

A. 168
B. 248
C. 320
D. 328

13. $\begin{array}{r} 407 \\ \times\ 8 \\ \hline \end{array}$

A. 2,456
B. 3,256
C. 3,336
D. 3,606

14. $\begin{array}{r} 671 \\ \times\ 35 \\ \hline \end{array}$

A. 3,355
B. 5,485
C. 24,655
D. 23,485

15. $9\overline{)2,277}$

A. 328
B. 258 r5
C. 253
D. 241 r8

16. $9\overline{)36,774}$

A. 486
B. 3,086
C. 4,863 r7
D. 4,086

17. $\begin{array}{r} .016 \\ \times\ 4 \\ \hline \end{array}$

A. 64
B. 6.4
C. .64
D. .064

go on to the next page

18. A total of 66 students can ride in a bus. Each school in the district has 8 buses that can be used to carry students to and from school. If there are 26 schools in the district, how many students can be bused in the district at one time?

A. 528

B. 1,716

C. 4,728

D. 13,728

19. There are 24 beads on a necklace. The beads are red, blue, or yellow. $\frac{2}{3}$ of the beads are red. Two of the beads are blue. What fractional part of the necklace is yellow beads?

A. $\frac{1}{3}$

B. $\frac{1}{4}$

C. $\frac{1}{5}$

D. $\frac{1}{6}$

Stop

KEY

MATH INVENTORY, FORM 5G, OCTOBER 1978 EDITION

1. B
2. A
3. D
4. A
5. B
6. B
7. D
8. B
9. C
10. B
11. A
12. A
13. B
14. D
15. C
16. D
17. D
18. D
19. B

5H

MATH INVENTORY

This inventory asks you to find the answers to different kinds of number problems. Some problems will be familiar to you. Some problems you may not have seen before.

EXAMPLE X

$5 + 3 = \square$

A. 6
B. 7
C. 8
D. 9

Mark all answers on your answer sheet by filling in the box below your choice. Be sure that the question number on your answer sheet is the same as the question number in your test booklet. When you're not sure of an answer, mark the answer you <u>think</u> is right.

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Center Grant No. OB-NIE-G-78-0217

1. $\frac{8}{10}$ =

A. $\frac{8}{5}$

B. $\frac{4}{5}$

C. $\frac{16}{5}$

D. $\frac{3}{5}$

2. $\frac{10}{12}$ =

A. $\frac{2}{6}$

B. $\frac{4}{6}$

C. $\frac{5}{6}$

D. $\frac{20}{6}$

3. $\frac{3}{8}$ =

A. .375

B. .125

C. .75

D. 2.66

4. 2.971 - .86 = $\square$

A. 2.111

B. 2.885

C. .02885

D. 885

go on to the next page

5. $4.3 + .26 + .019 = \square$

A. 8.8

B. .88

C. 4.579

D. 4.679

6. $\frac{1}{3} + \square = \frac{9}{12}$

A. $\frac{8}{9}$

B. $\frac{8}{12}$

C. $\frac{4}{12}$

D. $\frac{5}{12}$

7. $4\frac{3}{10} \times 7 = \square$

A. $30\frac{1}{10}$

B. $6\frac{1}{10}$

C. $28\frac{3}{10}$

D. 28

8. Which sentence is true?

A. $\frac{3}{4} > \frac{5}{6}$

B. $\frac{3}{4} = \frac{5}{6}$

C. $\frac{3}{4} < \frac{5}{6}$

go on to the next page

9. Bob found $\frac{3}{8}$ of a pail of peanuts. George found $1\frac{3}{4}$ pails of peanuts. How many pails did they find altogether?

A. $1\frac{6}{12}$

B. $2\frac{1}{4}$

C. $1\frac{3}{8}$

D. $2\frac{1}{8}$

10. Each floor of a building has 17 rooms. There are 34 floors. How many rooms are in the building?

A. 2

B. 272

C. 558

D. 578

go on to the next page

11. $\begin{array}{r} 1,496 \\ +\ 5,657 \end{array}$

A. 6,043
B. 7,153
C. 7,053
D. 61,418

12. $\begin{array}{r} 175 \\ \times\ \ 8 \end{array}$

A. 850
B. 1,390
C. 1,405
D. 1,400

13. $\begin{array}{r} 59 \\ \times\ 26 \end{array}$

A. 1,484
B. 1,434
C. 1,534
D. 1,584

14. $\begin{array}{r} 782 \\ \times\ 607 \end{array}$

A. 5,474
B. 474,674
C. 52,394
D. 475,674

15. $4\overline{)3,480}$

A. 87
B. 869
C. 870
D. 807

16. $6\overline{)28,842}$

A. 487
B. 4,807
C. 4,870
D. 4,087

17. $\begin{array}{r} 29 \\ \times\ .003 \end{array}$

A. .087
B. .870
C. 8.70
D. 87.0

go on to the next page

18. Ace Company will sell 6 steel panels for $395. Barr Company will sell 8 steel panels for $625. If these are the only two companies selling steel panels, what is the lowest price a builder can pay for 96 steel panels?

A. $1,020

B. $2,370

C. $5,000

D. $6,320

E. $7,500

19. What is the total weight of a kite if the paper weighs .083 ounces, each of the two sticks weighs 1.21 ounces, and the tail weighs 5.6 ounces?

A. 6.893

B. 7.64

C. 8.103

D. 8.85

Stop

KEY

MATH INVENTORY, FORM 5H, OCTOBER 1978 EDITION

1. B
2. C
3. A
4. A
5. C
6. D
7. A
8. C
9. D
10. D
11. B
12. D
13. C
14. B
15. C
16. B
17. A
18. D
19. C

APPENDIX C

Domain Referenced Tests
Comparative Study

Grade 2

Included in this appendix are the three test forms administered to the Grade 2 students in the math part of the Comparative Study. The first form was administered in October (Test Time 1), the second in January (Test Time 4), and the third in May (Test Time 8). Test form DR2B was given at Test Time 1, test form DR2A was given at Test Time 4, and test form DR2C was given at Test Time 8.

MATH PROBLEMS
Form DR2B

ID ___ ___ ___

NAME _____ SCHOOL _____

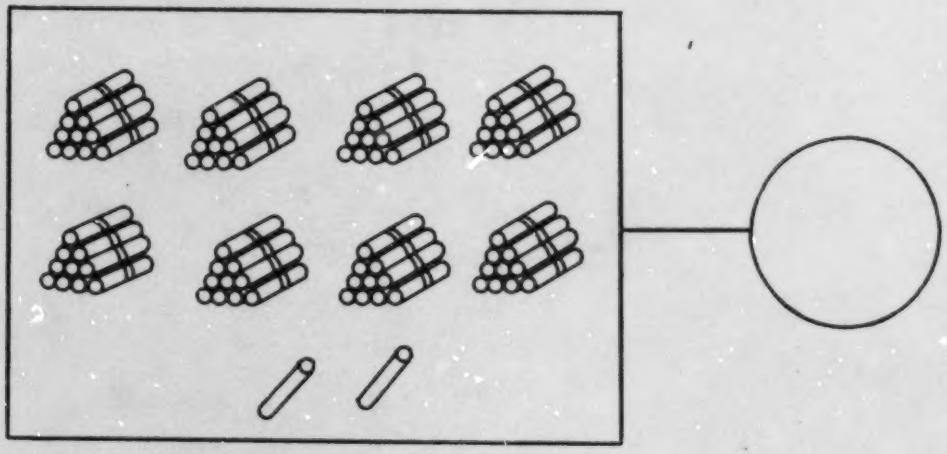
In this booklet there are some problems for you to do. Show all of your work and write your answers in this booklet. Some of the problems you may not know how to do. This is OK. Leave these problems blank and go on to the ones you know how to do. Wait until you are told to begin.

Phase IV
IGE Evaluation
October 1978

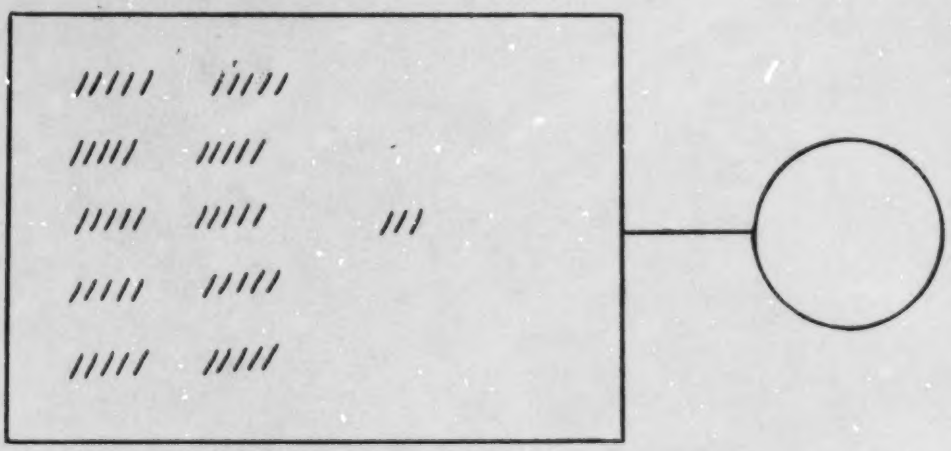
Published by the Wisconsin Research and Development Center for Individualized Schooling. The project presented or reported herein was performed pursuant to a grant from the National Institute of Education, Department of Health, Education, and Welfare. However, the opinions expressed herein do not necessarily reflect the position or policy of the National Institute of Education, and no official endorsement by the National Institute of Education should be inferred.

Center Contract No. OB-NIE-G-78-0217

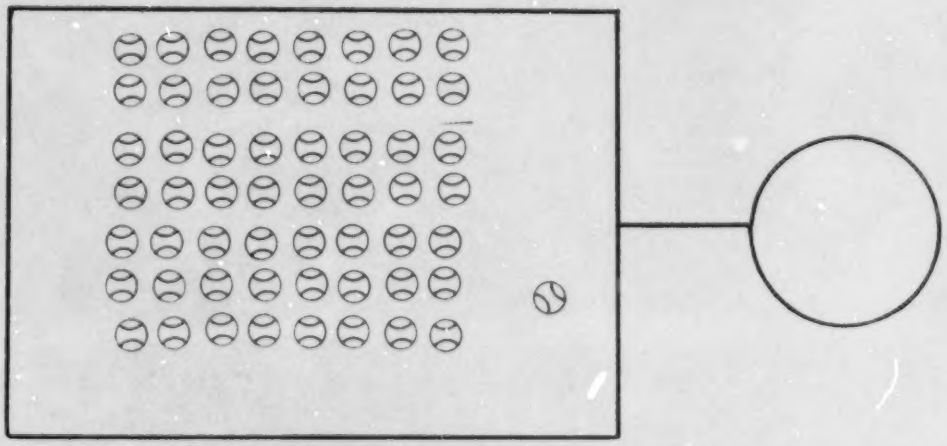
1. In the circle write the number that tells how many sticks are in the box.



2. In the circle write the number that tells how many tally marks are in the box.



3. In the circle write the number that tells how many balls are in the box.



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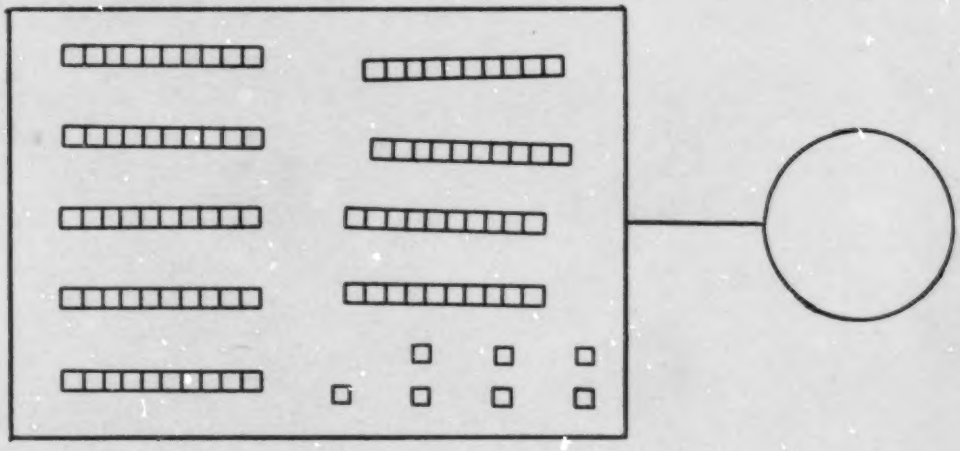
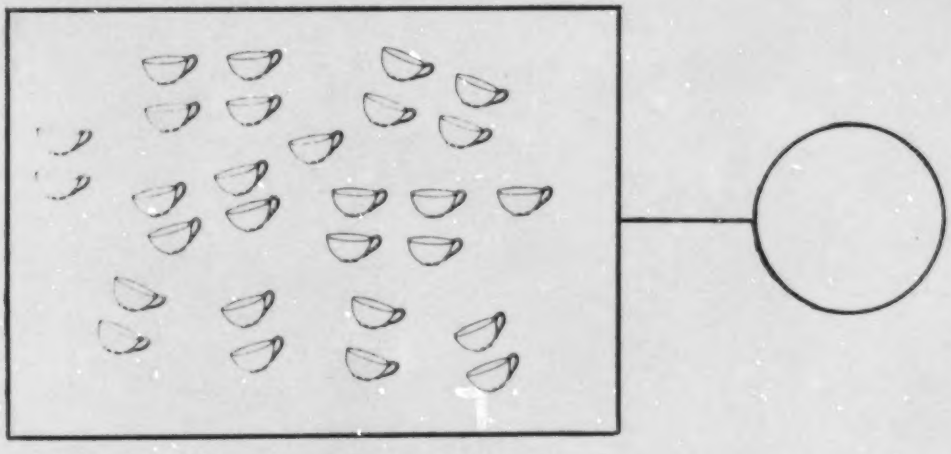
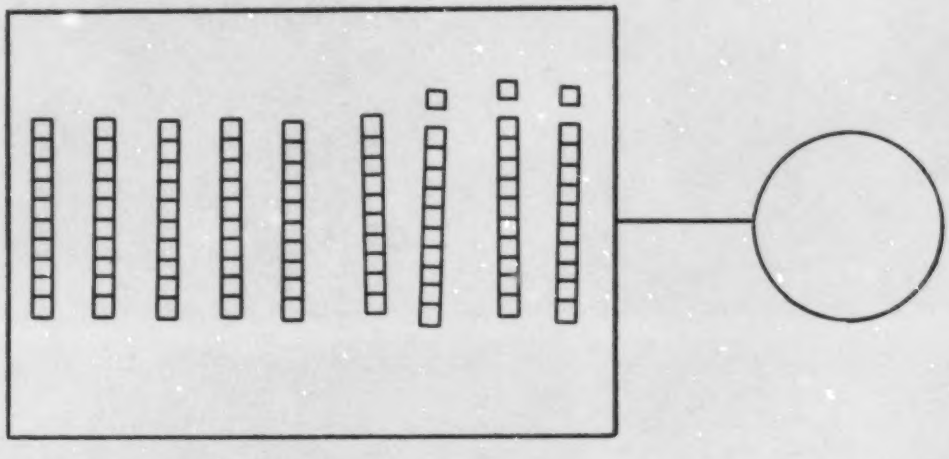
4. In the circle write the number that tells how many squares are in the box.



5. In the circle write the number that tells how many cups are in the box.



6. In the circle write the number that tells how many squares are in the box.



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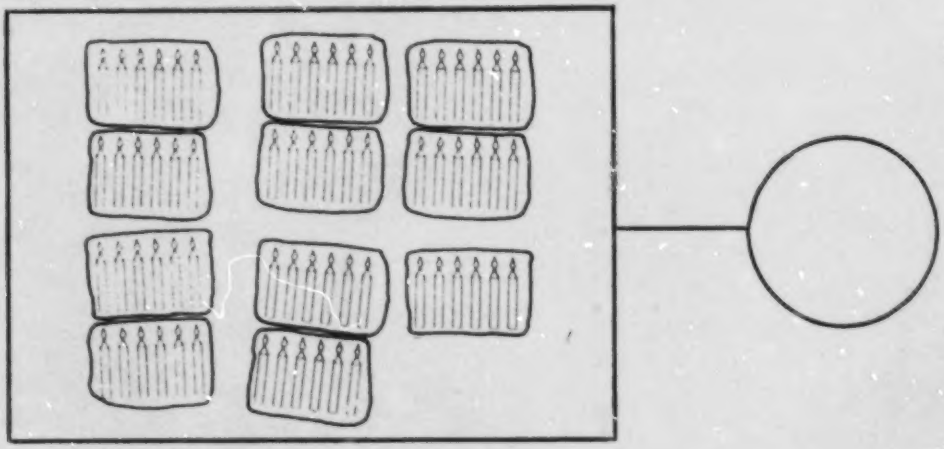
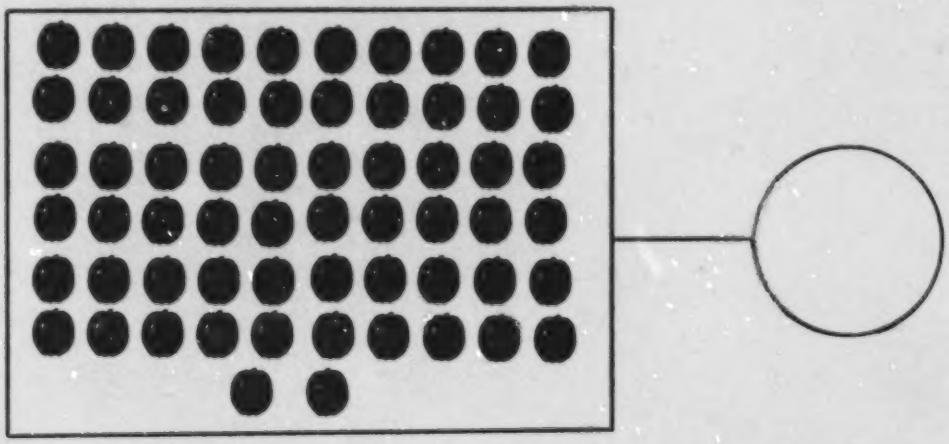
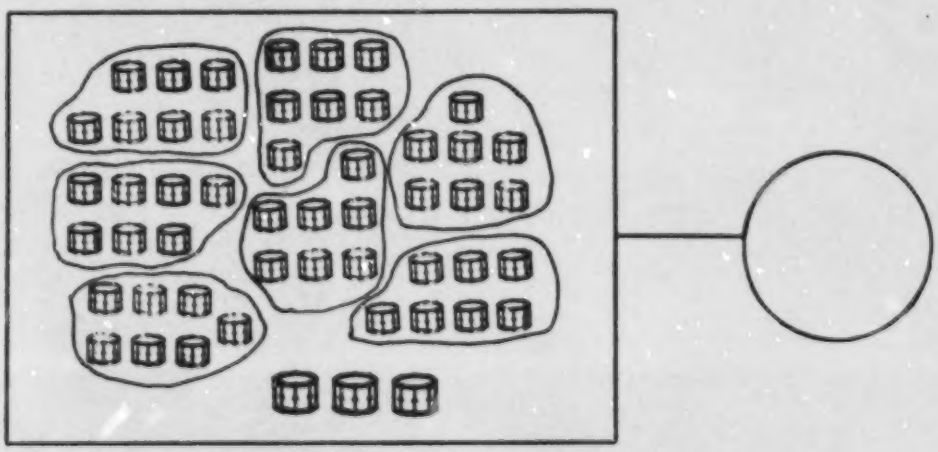
7. In the circle write the number that tells how many candles are in the box.



8. In the circle write the number that tells how many apples are in the box.



9. In the circle write the number that tells how many drums are in the box.



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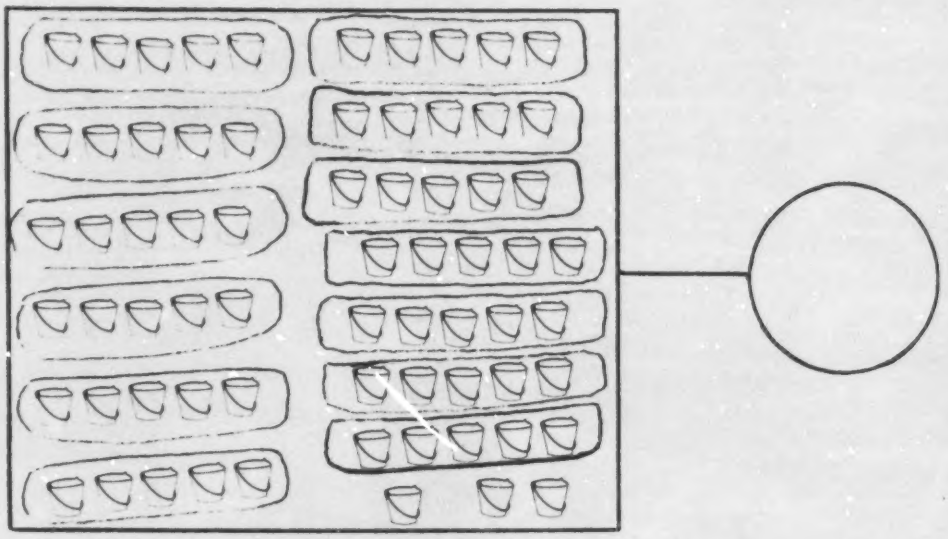
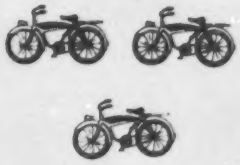
10. In the circle write the number that tells how many pails are in the box.



EXAMPLE

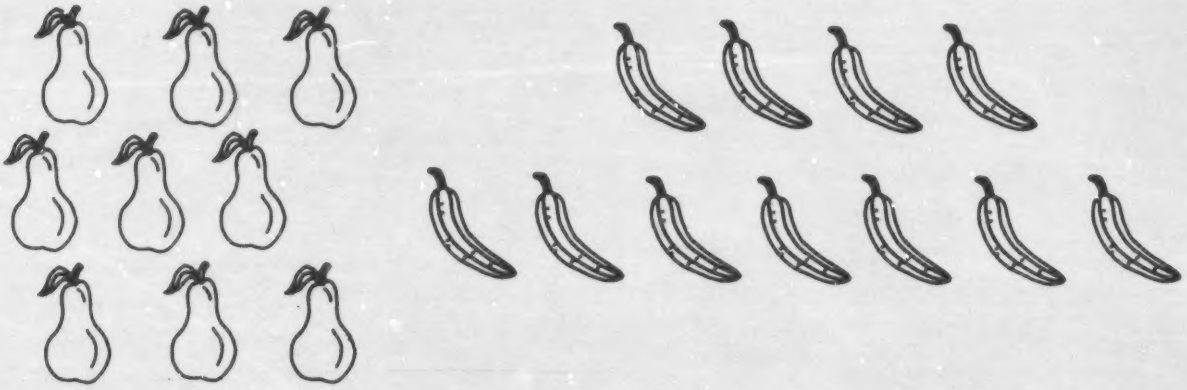
Write a sentence with a ☐ about the picture. You do not have to solve your sentence.



How many wagons and bikes are there? 2+3 = ☐

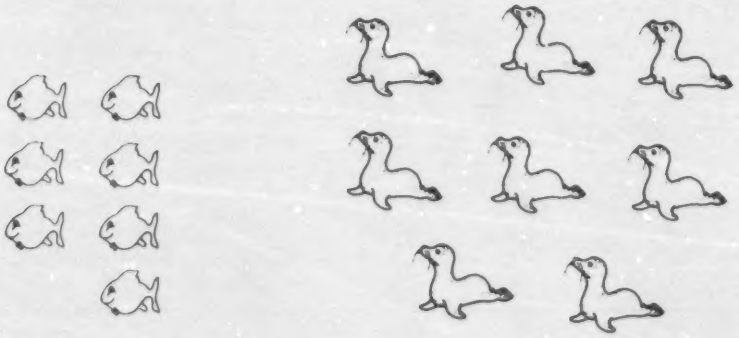
go on to the next page

Write a sentence with a ☐ about each picture. You do not have to solve your sentence.



11. How many more bananas than pears are there? _____

12. How many shovels and pails are there? _____



13. How many more seals than fish are there? _____

Write a sentence with a ☐ about each story. You do not have to solve your sentence.

14. On Tuesday Melinda won 31 marbles.
On Wednesday she won some more marbles.
She won 64 marbles altogether.
How many marbles did she win on Wednesday? _____

15. Heidi's soccer team won 6 games in the fall.
Her team won 6 games in the spring. How many games did Heidi's team win altogether? _____

16. Julia counted 16 boxes on the floor.
She counted 8 boxes on the table.
How many more boxes were on the floor than on the table? _____

17. Mike had 94 cans in his collection.
He gave away some of the cans.
Now he has 20 cans.
How many did Mike give away? _____

18. Carl bought 28 pears.
He also bought 10 bananas.
How many fewer bananas did he buy than pears? _____

19. Jackie has 96 sticks.
63 sticks are large and the rest are small.
How many sticks are small? _____

20. Max had 23 balloons.
He had some ribbons, too.
Then he gave away 20 ribbons.
Now Max has the same number of balloons as he has ribbons.
How many ribbons did he have at first? _____

go on to the next page

Solve the sentences. Write your answer in the box.

21. $11 - \square = 7$

22. $20 = 9 + \square$

23. $17 - 9 = \square$

24. $16 = \square - 3$

25. $\square = 7 + 3$

26. $\square + 9 = 16$

27. $0 = 2 - \square$

28. $\square - 5 = 13$

29. $8 = \square + 3$

30. $12 + 1 = \square$

Stop

MATH PROBLEMS
Form DR2A

ID ___ ___ ___

NAME _____ SCHOOL _____

In this booklet there are some problems for you to do. Show all of your work and write your answers in this booklet. Some of the problems you may not know how to do. This is OK. Leave these problems blank and go on to the ones you know how to do. Wait until you are told to begin.

Phase IV
IGE Evaluation
January 1979

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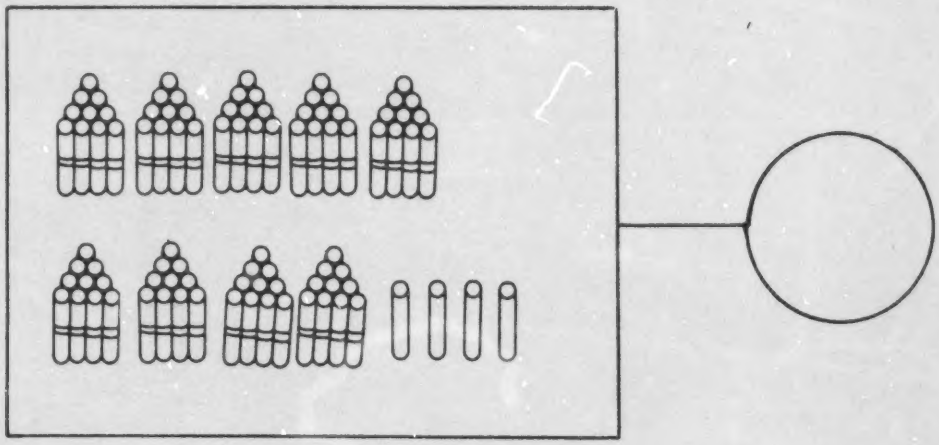
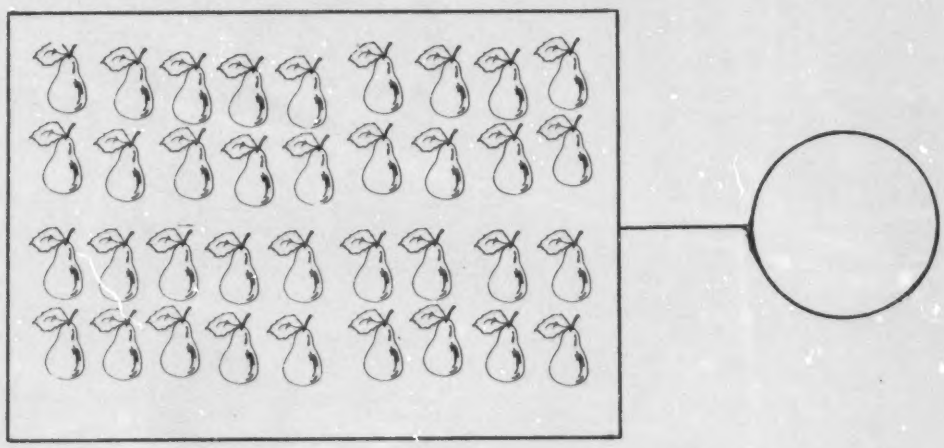
Center Grant No. OB-NIE-G-78-0217

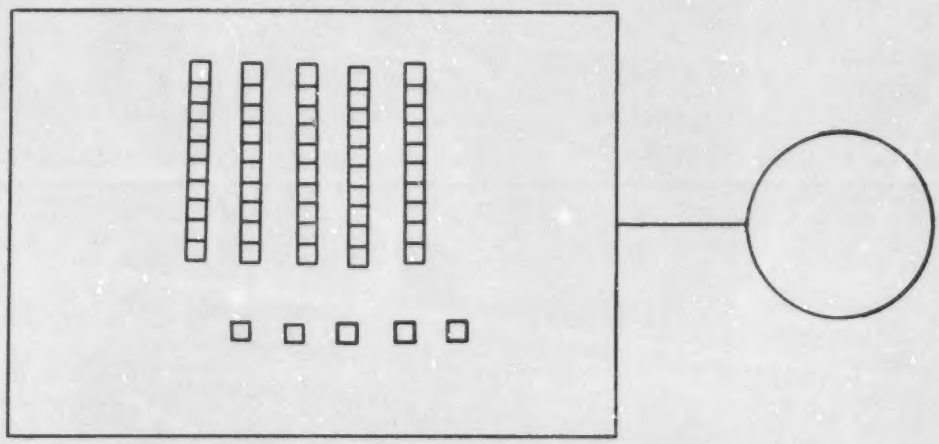
1. In the circle write the number that tells how many sticks are in the box.



2. In the circle write the number that tells how many pears are in the box.



3. In the circle write the number that tells how many squares are in the box.



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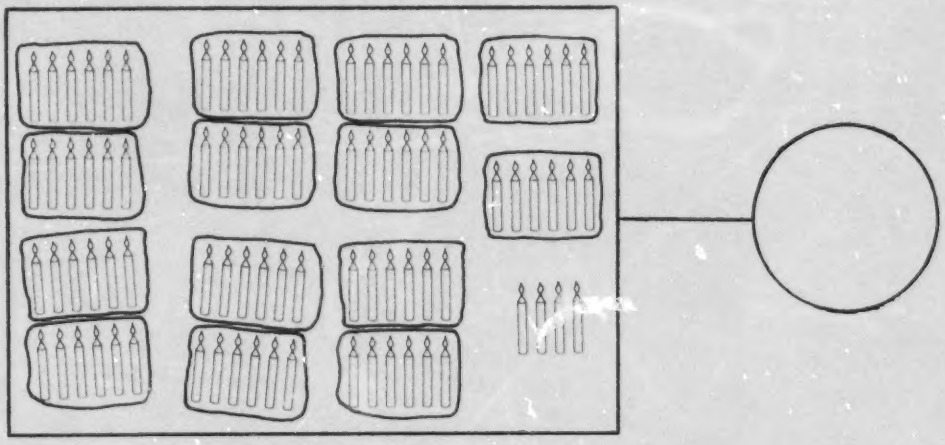
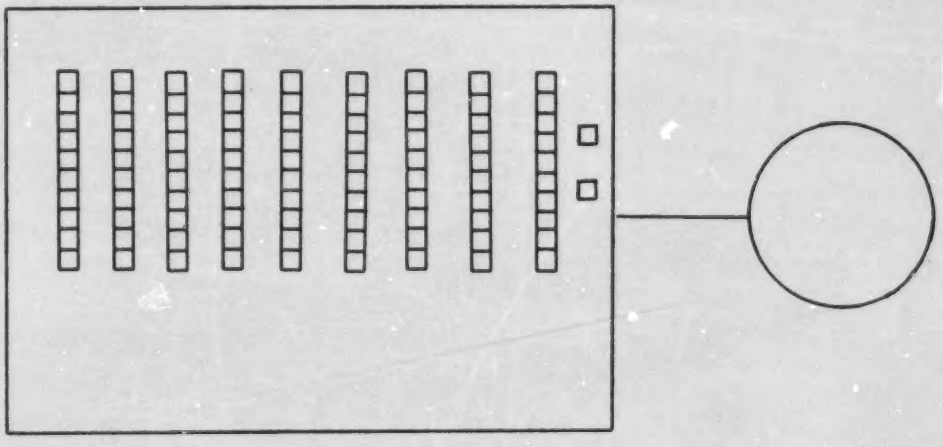
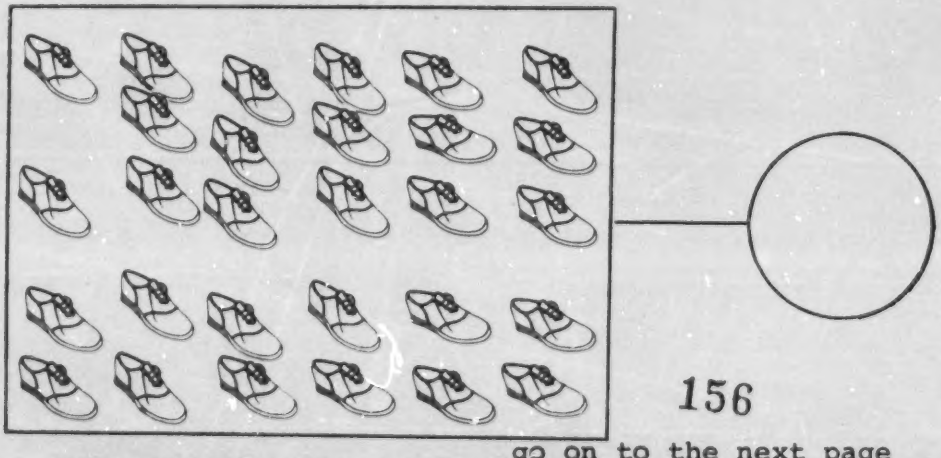
4. In the circle write the number that tells how many candles are in the box.



5. In the circle write the number that tells how many squares are in the box.



6. In the circle write the number that tells how many shoes are in the box.



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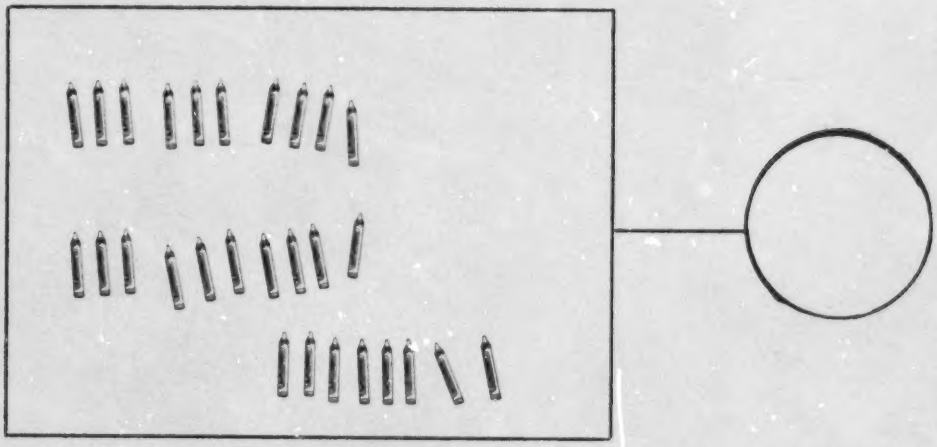
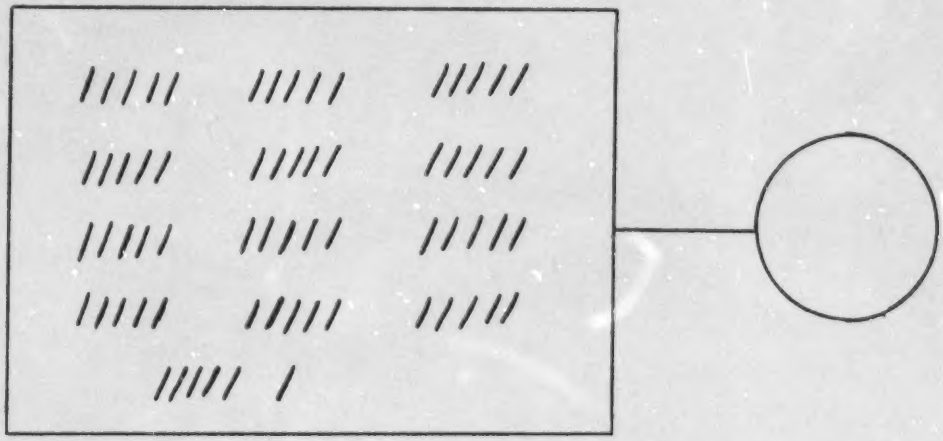
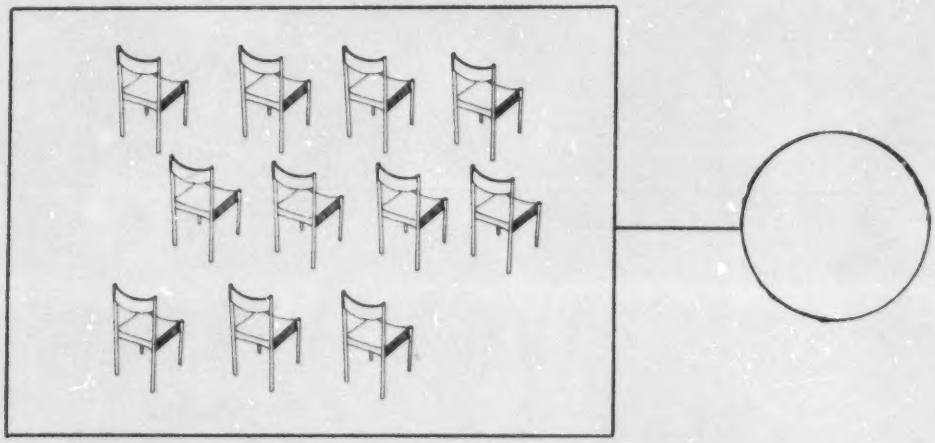
7. In the circle write the number that tells how many crayons are in the box.



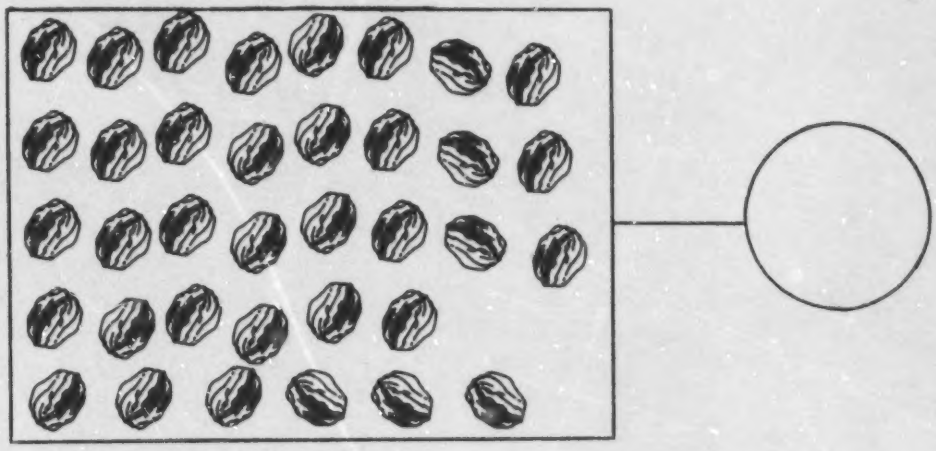
8. In the circle write the number that tells how many tally marks are in the box.



9. In the circle write the number that tells how many chairs are in the box.

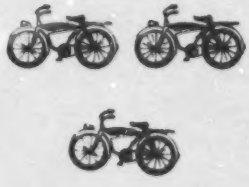


10. In the circle write the number that tells how many nuts are in the box.



EXAMPLE

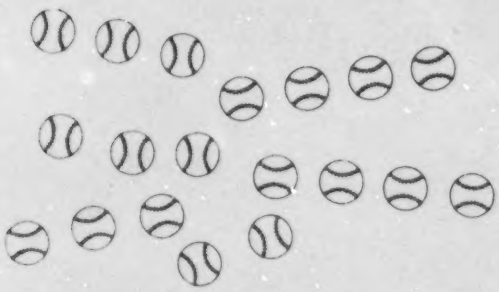
Write a sentence with a ☐ about the picture. You do not have to solve your sentence.

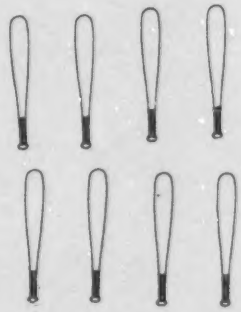


How many wagons and bikes are there? $2+3=\square$

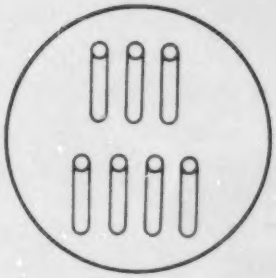
go on to the next page

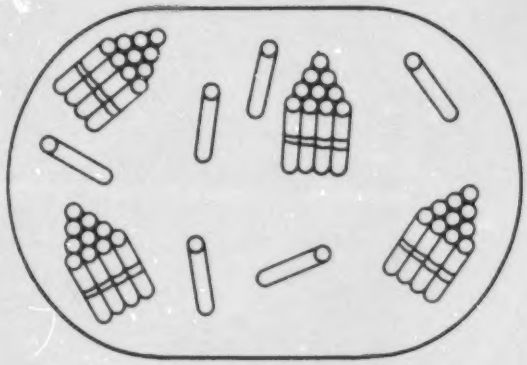
Write a sentence with a ☐ about each picture and story.
You do not have to solve your sentence.





11. How many more baseballs than bats are there? _____





12. How many sticks are there altogether? _____

13. 97 birds were sitting on a tree.
96 birds were blackbirds and the rest were bluebirds.
How many birds were bluebirds? _____

go on to the next page

Write a sentence with a ☐ about each story. You do not have to solve your sentence.

14. At eight a.m. some students are waiting in line. At nine a.m. 48 more students come to wait in line. Now there are 64 students waiting in line. How many students were waiting in line at eight a.m.? _____

15. The second graders were watching a movie. There were 55 girls and 39 boys. How many second graders were watching a movie? _____

16. There were 70 beads in two boxes. Some were in a red box and 28 were in a blue box. How many beads were in the red box? _____

17. The baker made some cookies and sold 58 of them. 14 cookies were left. How many cookies did the baker make? _____

18. Oscar has 15 baseball cards. Alice has 63 baseball cards. How many baseball cards do they have altogether? _____

19. Sarah washed some windows on Wednesday. On Thursday she washed 60 windows. Sarah washed 64 windows altogether. How many windows did she wash on Wednesday? _____

20. A baseball team played some games. The team won 64 games and lost 29 games. How many games did the team play? _____

Solve the sentences. Write your answer in the box

21. $20 - \square = 10$

22. $\square + 2 = 10$

23. $13 = 3 + \square$

24. $11 = 16 - \square$

25. $11 - 5 = \square$

26. $\square - 9 = 7$

27. $8 = \square - 9$

28. $12 = \square + 4$

29. $\square = 4 + 16$

30. $9 + 8 = \square$

Stop

MATH PROBLEMS
Form DR2C

ID ___ ___ ___

NAME _____ SCHOOL _____

In this booklet there are some problems for you to do. Show all of your work and write your answers in this booklet. Some of the problems you may not know how to do. This is OK. Leave these problems blank and go on to the ones you are familiar with. Wait until you are told to begin.

Phase IV
IGE Evaluation
May 1979

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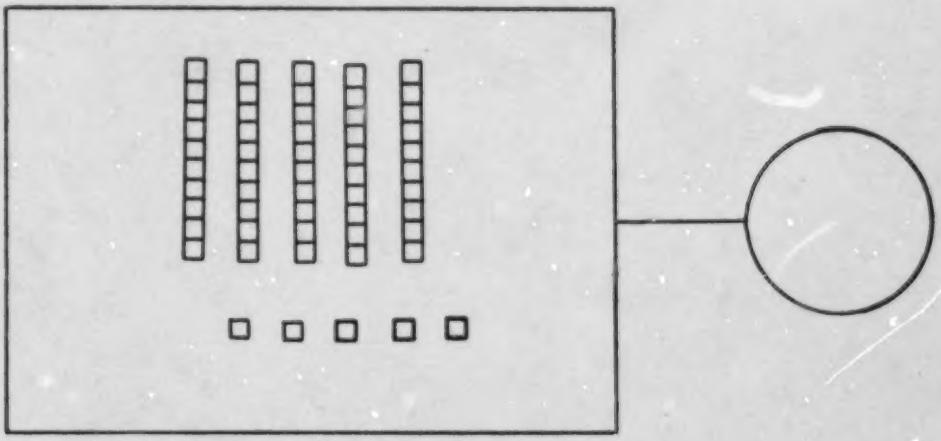
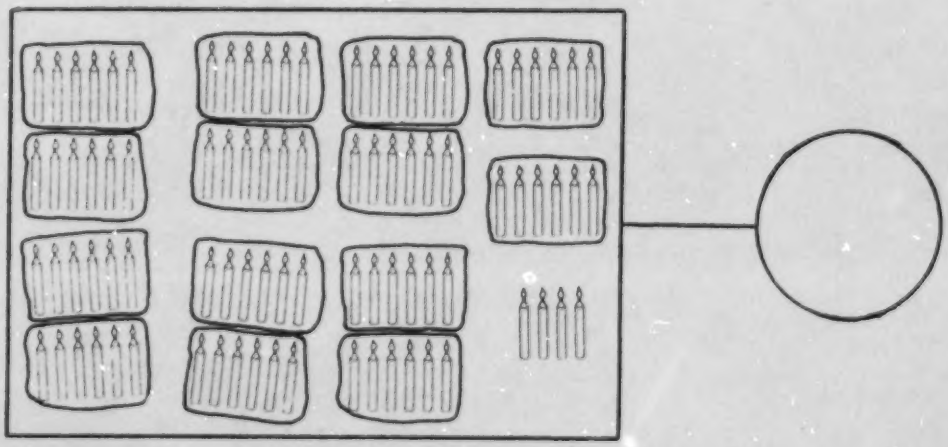
Center Grant No. OB-NIE-G-78-0217

1. In the circle write the number that tells how many blocks are in the box.



2. In the circle write the number that tells how many shoes are in the box.

3. In the circle write the number that tells how many candles are in the box.



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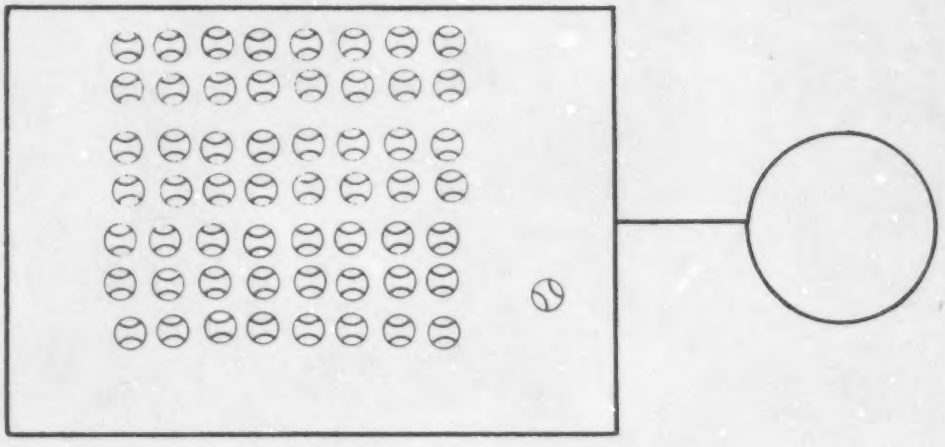
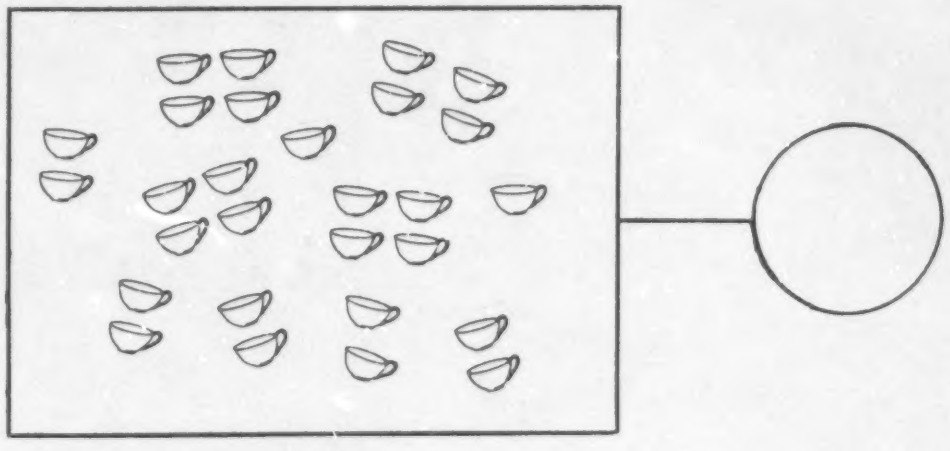
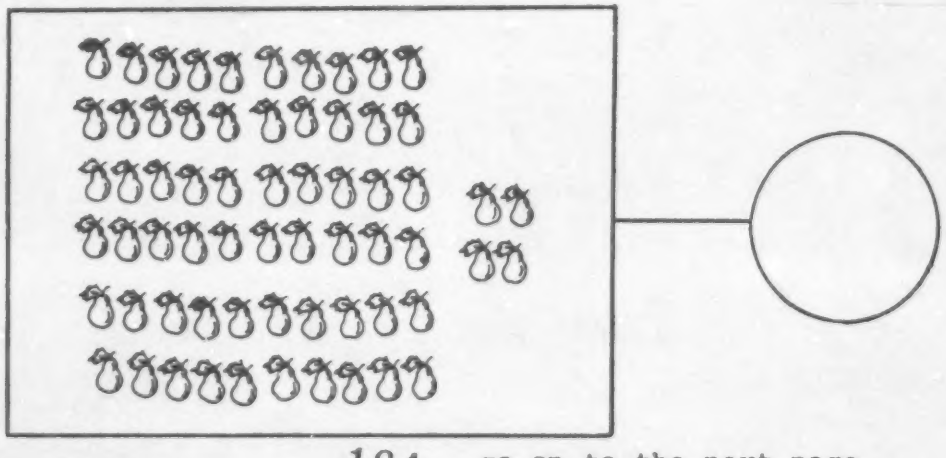
4. In the circle write the number that tells how many baseballs are in the box.



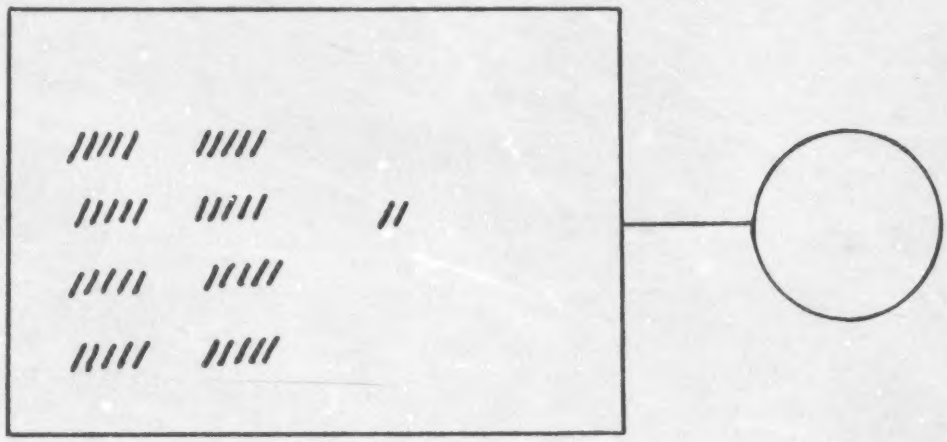
5. In the circle write the number that tells how many cups are in the box.



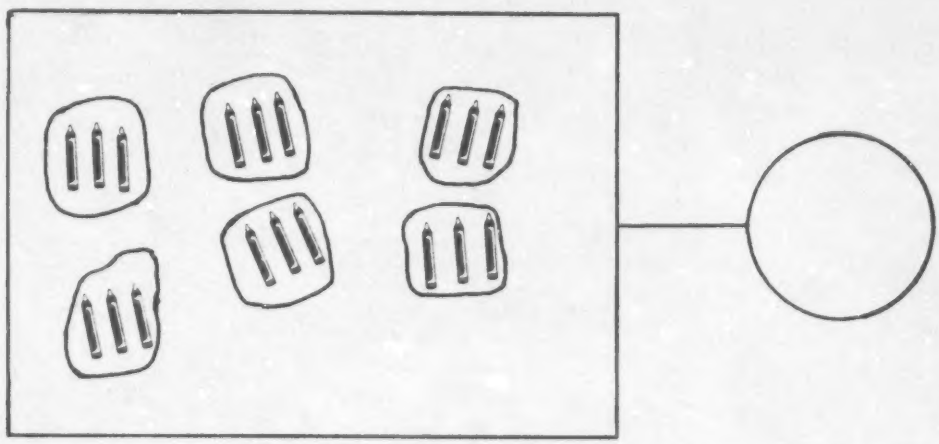
6. In the circle write the number that tells how many pears are in the box.



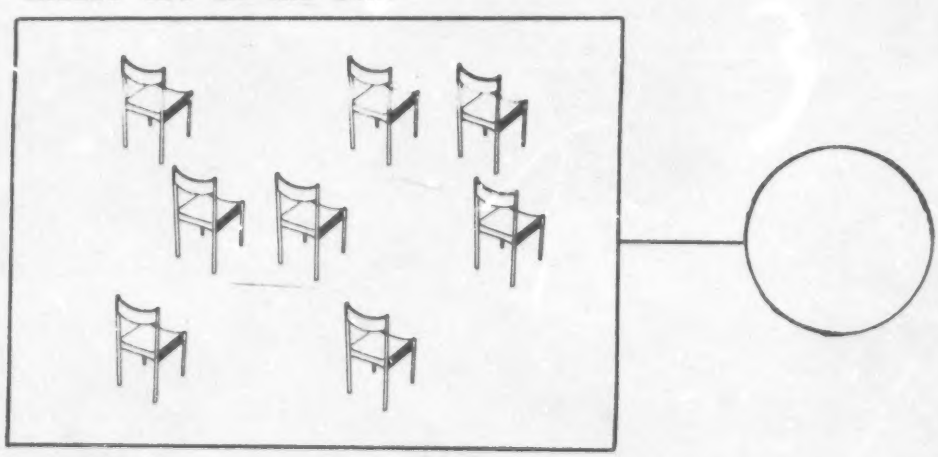
7. In the circle write the number that tells how many tally marks are in the box.



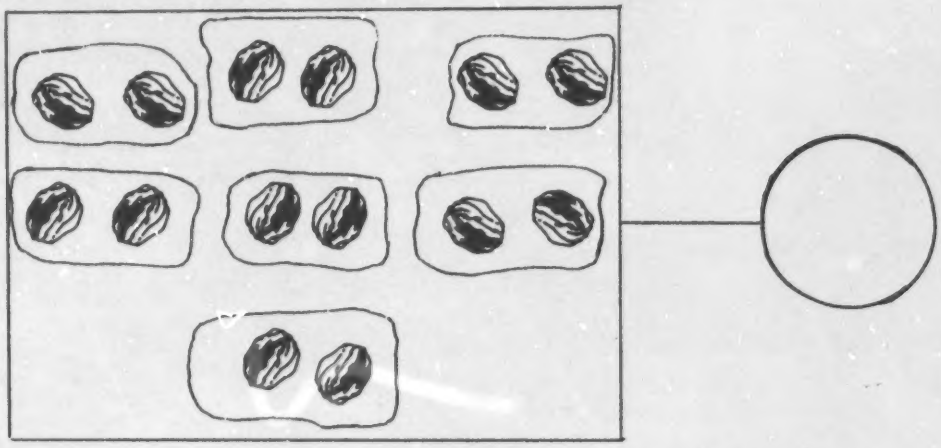
8. In the circle write the number that tells how many crayons are in the box.



9. In the circle write the number that tells how many chairs are in the box.

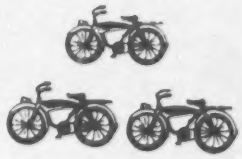


10. In the circle write the number that tells how many nuts are in the box.



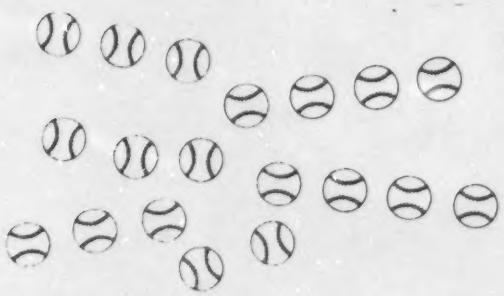
EXAMPLE

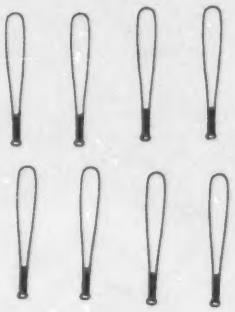
Write a sentence with a ☐ about the picture. You do not have to solve your sentence.



How many wagons and bikes are there? 2+3=☐

Write a sentence with a ☐ about each picture and story.
You do not have to solve your sentence.





11. How many more baseballs than bats are there? _____

12. Jackie has 96 sticks.
63 sticks are large and the rest are small. How many sticks are small? _____

13. In January some snow fell and in February 37 inches of snow fell. 49 inches of snow fell during the two months. How many inches of snow fell in January? _____

14. Cathy found 63 shells. Some are white. 22 of the shells are gray. How many white shells did Cathy find? _____

15. There were 70 beads in two boxes.
Some were in a red box and 28 were in a blue box. How many beads were in the red box? _____

go on to the next page

16. Mike had 94 cans in his collection. He gave away some of the cans. Now he has 20 cans. How many cans did Mike give away? _____

17. Jody and Sam together have 81 bottle caps. Sam has 40 bottle caps. How many bottle caps does Jody have? _____

18. On Tuesday Melinda won 31 marbles. On Wednesday she won some more marbles. She won 64 marbles altogether. How many marbles did she win on Wednesday? _____

19. Jacob ran some laps around the field. Damon ran 8 laps around the field. Jacob and Damon ran a total of 33 laps. How many laps did Jacob run? _____

20. There are now 56 books in the library. There were 76 books before some were checked out. How many books were checked out? _____

go on to the next page

Solve the sentences. Write your answer in the box.

21. $20 - \square = 10$

22. $11 - 5 = \square$

23. $11 = 16 - \square$

24. $\square + 9 = 16$

25. $\square = 7 + 3$

26. $1 + \square = 14$

27. $15 = \square - 4$

28. $13 = 5 + \square$

29. $2 + \square = 3$

30. $11 = \square + 11$

Stop

APPENDIX D

Domain Referenced Tests
Comparative Study

Grade 5

Included in this appendix are the three test forms administered to the Grade 5 students in the math part of the Comparative Study. The first form was administered in Octboer (Test Time 1), the second in January (Test Time 2), and the third in May (Test Time 3).

DIRECTIONS SHEET FOR ADMINISTERING MATH PROBLEMS DR5A

Materials for Testing

Each student will need:

- a Math Problems, Form DR5A, test booklet
- a sharpened pencil with an eraser
- a cleared desk top or space to work

Each test administrator will need:

- this directions sheet
- a Math Problems, Form DR5A, test booklet
- extra sharpened pencils with erasers
- a "Testing: Do Not Disturb" sign for the door
- a list for students absent from testing

Identification Information

Students should be directed to print the following information on the test booklet cover: first and last name, and school.

DIRECTIONS FOR ADMINISTERING THE TEST

Direct students to read the directions on the test booklet cover silently as you read them aloud. Students should read and complete the test on their own. However, you may help students work through the example given for a problem type if they don't understand what they are to do.

MATH PROBLEMS
Form DR5A

ID ___ ___ ___

NAME _____ SCHOOL _____

In this booklet there are some problems for you to do. For each type of problem there are directions and an example that has been worked for you. If you don't understand what you are to do, raise your hand and I will come and help you. Show all of your work and write your answers in this booklet. Some of the problems you may not know how to do. This is OK. Leave these problems blank and go on to the ones you do know how to work. Wait until you are told to begin.

Phase IV
IGE Evaluation
October 1978

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Center Contract No. OB-NIE-G-78-0217

Find the products. Example: $\begin{array}{r} 16 \\ \times\ 5 \\ \hline 80 \end{array}$

1. $\begin{array}{r} 18 \\ \times\ 6 \\ \hline \end{array}$

2. $\begin{array}{r} 75 \\ \times\ 7 \\ \hline \end{array}$

3. $\begin{array}{r} 138 \\ \times\ 6 \\ \hline \end{array}$

4. $\begin{array}{r} 36 \\ \times\ 35 \\ \hline \end{array}$

5. $\begin{array}{r} 582 \\ \times\ 9 \\ \hline \end{array}$

6. $\begin{array}{r} 61 \\ \times\ 30 \\ \hline \end{array}$

7. $\begin{array}{r} 78 \\ \times\ 33 \\ \hline \end{array}$

8. $\begin{array}{r} 49 \\ \times\ 51 \\ \hline \end{array}$

9. $\begin{array}{r} 497 \\ \times\ 8 \\ \hline \end{array}$

10. $\begin{array}{r} 61 \\ \times\ 78 \\ \hline \end{array}$

go on to the next page

Find the equivalent fraction or mixed number. Example: $\frac{2}{3} = \frac{\boxed{4}}{6}$

11. $\frac{4}{9} = \frac{\square}{18}$

12. $\frac{4}{5} = \frac{\square}{15}$

13. $\frac{3}{4} = \frac{\square}{8}$

14. $3\frac{1}{6} = \frac{\square}{6}$

15. $1 = \frac{\square}{2}$

16. $\frac{8}{5} = \square\frac{\square}{5}$

17. $\frac{16}{18} = \frac{\square}{9}$

18. $\frac{27}{10} = \square\frac{\square}{10}$

19. $\frac{2}{12} = \frac{\square}{6}$

20. $2\frac{1}{16} = \frac{\square}{16}$

go on to the next page

Divide. Example: $4\overline{)15216}$ = 3804

21. $2\overline{)704}$

22. $4\overline{)2112}$

23. $7\overline{)92547}$

24. $9\overline{)8073}$

25. $3\overline{)4290}$

26. $6\overline{)24846}$

Divide.

27. $5\overline{)730}$

28. $7\overline{)8946}$

29. $8\overline{)912}$

30. $9\overline{)82746}$

Stop

MATH PROBLEMS
Form DR5B

ID ___ ___ ___

NAME _____ SCHOOL _____

In this booklet there are some problems for you to do. For each type of problem there are directions and an example that has been worked for you. If you don't understand what you are to do, raise your hand and I will come and help you. Show all of your work and write your answers in this booklet. Some of the problems you may not know how to do. This is OK. Leave these problems blank and go on to the ones you do know how to work. Wait until you are told to begin.

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Center Grant No. OB-NIE-G-78-0217

Find the products. Example: $\begin{array}{r} 16 \\ \times\ 5 \\ \hline 80 \end{array}$

1. $\begin{array}{r} 98 \\ \times\ 6 \\ \hline \end{array}$

2. $\begin{array}{r} 876 \\ \times\ 4 \\ \hline \end{array}$

3. $\begin{array}{r} 75 \\ \times\ 21 \\ \hline \end{array}$

4. $\begin{array}{r} 73 \\ \times\ 80 \\ \hline \end{array}$

5. $\begin{array}{r} 852 \\ \times\ 6 \\ \hline \end{array}$

6. $\begin{array}{r} 65 \\ \times\ 86 \\ \hline \end{array}$

7. $\begin{array}{r} 58 \\ \times\ 14 \\ \hline \end{array}$

8. $\begin{array}{r} 343 \\ \times\ 13 \\ \hline \end{array}$

9. $\begin{array}{r} 56 \\ \times\ 44 \\ \hline \end{array}$

10. $\begin{array}{r} 47 \\ \times\ 27 \\ \hline \end{array}$

go on to the next page

Find the equivalent fraction or mixed number. Example: $\frac{2}{3} = \frac{\boxed{4}}{6}$

11. $\frac{6}{9} = \frac{\square}{3}$

12. $\frac{2}{3} = \frac{\square}{12}$

13. $\frac{5}{9} = \frac{\square}{18}$

14. $\frac{15}{4} = \square\ \frac{\square}{4}$

15. $\frac{6}{8} = \frac{\square}{4}$

16. $2\ \frac{1}{3} = \frac{\square}{3}$

17. $1 = \frac{\square}{3}$

18. $\frac{9}{2} = \square\ \frac{\square}{2}$

19. $\frac{6}{12} = \frac{\square}{4}$

20. $3\frac{2}{6} = \frac{\square}{6}$

Divide. Example: $4\overline{)15216}$ $\quad 3804$

21. $6\overline{)786}$

22. $4\overline{)3876}$

23. $6\overline{)2244}$

24. $3\overline{)1911}$

25. $4\overline{)256}$

26. $9\overline{)29277}$

go on to the next page

Divide.

27. $5\overline{)97340}$

28. $4\overline{)81164}$

29. $1\overline{)397}$

30. $4\overline{)8720}$

Stop

MATH PROBLEMS
Form DR5C

ID ___ ___ ___

NAME _____ SCHOOL _____

In this booklet there are some problems for you to do. For each type of problem there are directions and an example that has been worked for you. If you don't understand what you are to do, raise your hand and I will come and help you. Show all of your work and write your answers in this booklet. Some of the problems you may not know how to do. This is OK. Leave these problems blank and go on to the ones you do know how to work. Wait until you are told to begin.

Phase IV
IGE Evaluation
May 1979

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Center Grant No. OB-NIE-G-78-0217

Find the products. Example: $\begin{array}{r} 12 \\ \times\ 6 \\ \hline 72 \end{array}$

1. $\begin{array}{r} 138 \\ \times\ 6 \\ \hline \end{array}$

2. $\begin{array}{r} 61 \\ \times\ 30 \\ \hline \end{array}$

3. $\begin{array}{r} 36 \\ \times\ 35 \\ \hline \end{array}$

4. $\begin{array}{r} 75 \\ \times\ 21 \\ \hline \end{array}$

5. $\begin{array}{r} 852 \\ \times\ 6 \\ \hline \end{array}$

6. $\begin{array}{r} 103 \\ \times\ 85 \\ \hline \end{array}$

7. $\begin{array}{r} 65 \\ \times\ 45 \\ \hline \end{array}$

8. $\begin{array}{r} 87 \\ \times\ 92 \\ \hline \end{array}$

9. $\begin{array}{r} 63 \\ \times\ 27 \\ \hline \end{array}$

10. $\begin{array}{r} 903 \\ \times\ 6 \\ \hline \end{array}$

Find the equivalent fraction or mixed number. Example: $\frac{2}{3} = \frac{\boxed{4}}{6}$

11. $\frac{8}{10} = \frac{\square}{5}$

12. $\frac{4}{5} = \frac{\square}{15}$

13. $\frac{5}{9} = \frac{\square}{18}$

14. $\frac{8}{8} = \frac{\square}{6}$

15. $\frac{3}{4} = \frac{\square}{12}$

16. $\frac{8}{5} = \square\ \frac{\square}{5}$

17. $\frac{16}{18} = \frac{\square}{9}$

18. $\frac{9}{2} = \square\ \frac{\square}{2}$

19. $2\ \frac{1}{6} = \frac{\square}{6}$

20. $1\ \frac{4}{16} = \frac{\square}{16}$

go on to the next page

Divide. Example: $4\overline{)15216}$ 3804

21. $2\overline{)704}$

22. $3\overline{)4290}$

23. $9\overline{)8073}$

24. $6\overline{)2244}$

25. $6\overline{)786}$

26. $5\overline{)8610}$

go on to the next page

Divide.

27. $3\overline{)70935}$

28. $7\overline{)33502}$

29. $8\overline{)392}$

30. $4\overline{)80504}$

Stop

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